

JOURNAL

OF THE

AMERICAN VETERINARY MEDICAL ASSOCIATION

GENERAL ARTICLES

- Mucormycosis in Food-Producing Animals—*Davis—Anderson—McCrory* . . 261

SURGERY AND OBSTETRICS

- The Relative Bactericidal Activity of the Uterine and Body Cavities of
Estrous and Pseudopregnant Rabbits—*Hawk—Simon—Cohen—
McNutt—Casida* 268

CLINICAL DATA

- Studies on Bovine Leptospirosis. I. Some Effects of Dihydrostreptomycin and
Terramycin on the Carrier Condition in Bovine Leptospirosis—*Ringen—
Bracken—Kenzy—Gillespie* 272
- Some Observations on Carriers of Equine Infectious Anemia—*Stein—Mott—
Gates* 277
- Cholelithiasis in a Cat—*Fred J. Wigderson* 287
- Distemper in Dogs. I. Virus-Neutralizing Antibodies in Serum Collected from
Healthy Dogs—*Ott—Gorham—Gutierrez* 290
- Antibiotic-Resistant Micrococci in Subclinical Mastitis—*Alford—Lusi—
McCrory* 294
- Malignant Hemangio-Endothelioma of the Canine Heart—*Leo L. Lieberman* . 296
- Coccidioidomycosis in the Dog—*Charles H. Burger and Norman E. Levan* . 297
- Toxicity of Malathion and Chlorthion to Dogs and Cats—*Bell—Price—Turk* . 302
- A New Ascaricide for Swine—*George R. Burch and Harry E. Blair* 304
- What Is Your Diagnosis? 309
- Strangulated Testicle of a Cryptorchid (Dog)—*Paul T. White and
Peter Johnson, Jr.* 312
- The Effect of Hyperimmune Hog Cholera Serum on the Virus of African
Swine Fever—*Donald E. DeTray and Gordon R. Scott* 313

NUTRITION

- Canine Nutrition—*Thomas J. Jones* 315

EDITORIAL

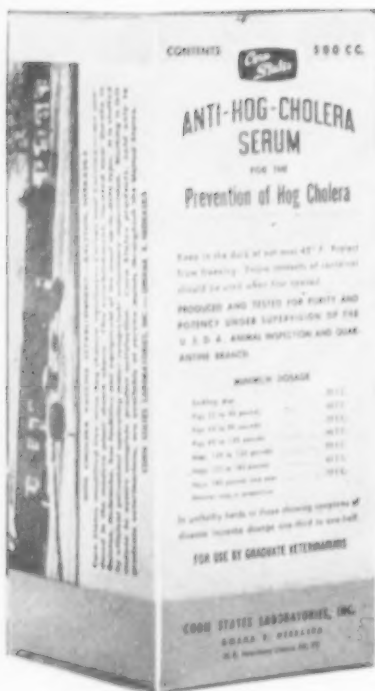
- Dispensing Versus Merchandising in Veterinary Practice 319

(Contents continued on adv. pages 2 and 4)

Volume 126

APRIL 1955

Number 937



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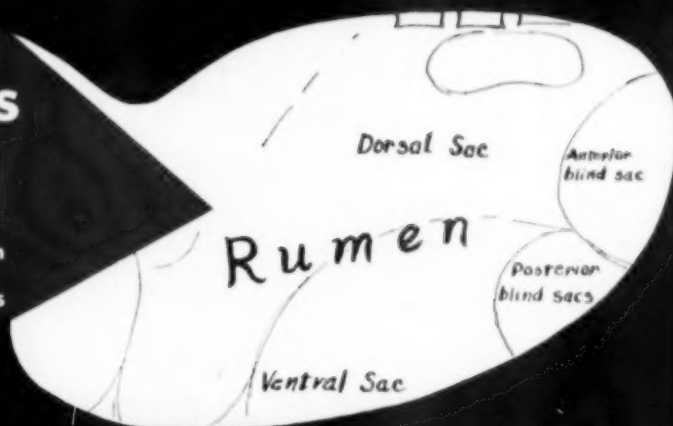
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CONTENTS

(Continued from Cover)

SURGERY AND OBSTETRICS

Fertility and Ejaculation Interval	270	Sperm Count Following Vasectomy	271
Therapy for Trichomoniasis in Cows	270	Cannibalism in Breeding Hens	271
Similarity of Equine Abortion and Equine Influenza Viruses	271	Spinal Anesthesia Sequela Report	271
Frozen Versus Unfrozen Semen Fertility ..	271	Success with Epididymal Semen	271
		Vibriosis in Dairy Heifers	271

CLINICAL DATA

National Poultry and Turkey Improvement Plans Revised	276	More on Tetanus Immunity Oddities	303
Interpreting the Brucellosis Test	276	Dirofilaria Immitis Larvae in Fleas	303
Neoplasia in the Dog	276	Treating Actinomycosis in a Dog	303
Evaluation of Bovine Ketosis Concepts and Therapy	288	Correction in Proceedings Book	308
More on Phenothiazine for Horses	293	Brucellosis in Man and Animals in Iowa .	308
Reactions from Hog Cholera Vaccine	293	Virus Infection in the Brain of Cats	308
Children Tested for Mycoses	293	Transmission of Equine Infectious Anemia Virus to Sheep	308
Ulcerative Stomatitis in Cats	293	Malignant Esophageal Tumors in Relation to Spirocerca Lupi in the Dog	310
Vaccinating Mink Against Distemper	296	Vitamin D Prevents Parturient Paresis ..	311
Propagating Viruses in Mammary Glands .	301	The Use of Hog Cholera Biological Products	312
Cause (Agene) of Canine Hysteria to Be Eliminated	303	Phenothiazine in Grub Control	314

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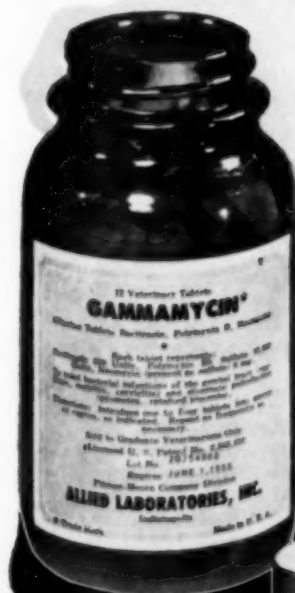
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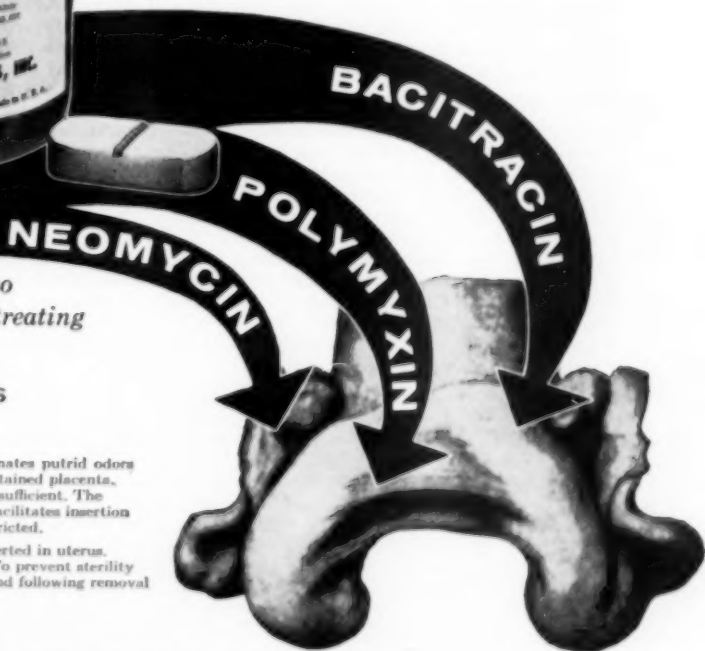
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CONTENTS—Continued

NUTRITION

- Affect on Foals of Feeding Aureomycin .. 318 Strip Grazing on the Increase 318

EDITORIAL

- A New Interest in Animal Mycoses 320 New Rules for Handling Hog Cholera
Antiserum and Hog Cholera Virus 320

CURRENT LITERATURE

ABSTRACTS

Canine Malignant Esophageal Tumors, 321; Growth of the Capon's Comb, 321; Histopathological Findings in Cows Infected with *Leptospira*, 321; Identification of *Vibrio* Fetus, 321; Procurement of Pigs by Hysterectomy, 322; Cultures of Human-Type Tubercle Bacilli, 322; Effect of Transmissible Gastroenteritis on the Metabolism of Baby Pigs, 322; Inflation of the Stomach of Sheep, 322.

FOREIGN ABSTRACTS

Use of Acetyl-Methionine in Large Animals, 322; Radiographic Diagnosis of Osteogenic Sarcoma, 323.

BOOKS AND REPORTS

General Pathology, 323; Comparative Anatomy of Domestic Animals, 323; Experimental Studies in Equine Infectious Anemia, 323; Infectious Diseases of Poultry, 324; The Nature of Virus Multiplication, 324; Introduction to the Pathogenic Anaerobes, 324; Canine Medicine, 324.

MOTION PICTURE FILMS

Anthrax in Ohio, 325; Bluetongue, 325; Canine Clinical Cases, 326; Control of Bovine Tuberculosis in California, 326; East Coast Fever, 326; Fighting Foot-and-Mouth Disease in Mexico, 326; Heartwater in Farm Animals, 327; It Pays to take It Easy, 327; Laboratory Diagnosis of Rabies, 327; Local Anesthesia in the Canine, 327; Meats with Approval, 328; Nagana, 328; Newcastle Disease, 328; Outbreak, 328; Pullorum Disease Control, 328; Scrapie, 329; Sheep Scab, 329; Some Uses for Gelfoam in Veterinary Surgery, 329; Striking Back Against Rabies, 329; Teschen Disease, 330; The Threat of the Cattle Fever Tick, 330; Tick Paralysis in Cattle and Buffalo, 330; Today's Chicks, 220; Triple Threat of Brucellosis, 331; Turkey Diseases, 331; U.S.A.F. Veterinary Services, 331; Use of Stader Reduction Splint in Treating Fractures of Small Animals, 331; Valiant Years, 332; Vesicular Exanthema, 332.

THE NEWS

- | | | | |
|---|-----|--------------------------------|-----|
| Ninety-Second Annual AVMA Convention | 333 | Student Chapter Activities | 338 |
| News from Washington | 336 | Women's Auxiliary | 339 |
| Special Committee on Insurance Polls | | U. S. Government | 342 |
| Membership re Group Health and Accident Coverage | 337 | Applications | 342 |
| Dr. Dunne, Research Fellow, in Charge of Expanding Research Program | 337 | Among the States and Provinces | 343 |
| Seventh International Congress of Comparative Pathology | 338 | Foreign News | 351 |
| Veterinarian of the Year (illus.) | 338 | State Board Examinations | 351 |
| | | Veterinary Military Service | 351 |
| | | Births | 351 |
| | | Deaths | 352 |

MISCELLANEOUS

- Hereditary Alopecia in Cattle, 267; A Jockey Club Panel Discussion, 314.
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AVMA ★ Report

Veterinary Medical Activities

◆ President A. H. Quin appeared on the program of the Alabama V.M.A. at Birmingham, March 20-22.

★ ★ ★

◆ President-Elect Floyd Cross appeared on the program of the Manitoba V.M.A., Winnipeg, Canada, March 14-15.

★ ★ ★

◆ The AVMA Special Committee on Insurance met at Association Headquarters on March 3. A questionnaire to be mailed to all AVMA members to determine the number interested in group health and accident coverage was developed.

★ ★ ★

◆ Assistant Executive Secretary Kingman visited San Antonio, Texas, March 8-9 to discuss convention plans for 1956; Minneapolis, Minnesota, March 22-23 to meet with the Committee on Local Arrangements for the 1955 meeting; and Cleveland, Ohio, March 28-29 to survey facilities for the 1957 meeting.

★ ★ ★

◆ The Board of Governors at their meeting on February 11-12 approved the establishment of an Academic Standards Board for Graduates of Foreign Veterinary Colleges. The Academic Standards Board will (1) be available to state examining boards to make recommendations concerning the academic background and professional qualifications of graduates of foreign veterinary colleges, not presently recognized by the AVMA, who have applied for admittance to licensure in the respective states; (2) to serve as a screening board to review the academic background and proficiency in English of graduates of foreign veterinary colleges, who desire to apply for admittance to veterinary schools in the United States and Canada for additional training.

★ ★ ★

◆ Approximately 40 graduating seniors from the Alabama Polytechnic Institute, School of Veterinary Medicine, visited the AVMA offices on March 14. This was the third consecutive year a group of Alabama veterinary students have made such a trip to see the Chicago stockyards and to hear association officers and staff members explain the role of the AVMA as the national spokesman for the profession. The students also visited veterinary laboratories in Kankakee, Ill., and Indianapolis, Ind.

★ ★ ★

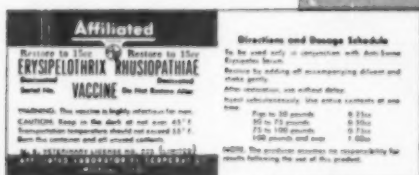
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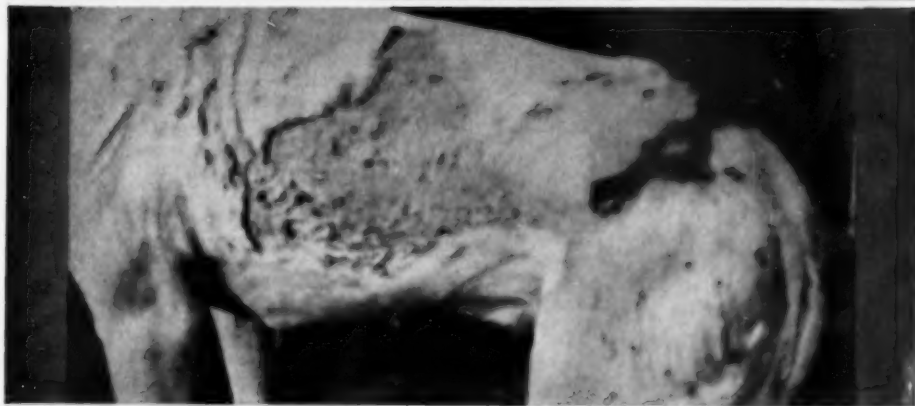
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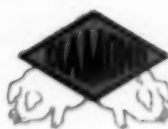
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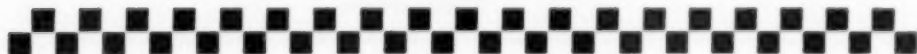
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1. Grumbles, L. C., Wills, F. K., and Boney, W. A.: J. Am. Vet. M. A. 124: 217, 1954. 2. Smith, H. W.: Vet. Rec. 66: 215, 1954. 3. Cosgrove, A. S.: Vet. Med. In press.

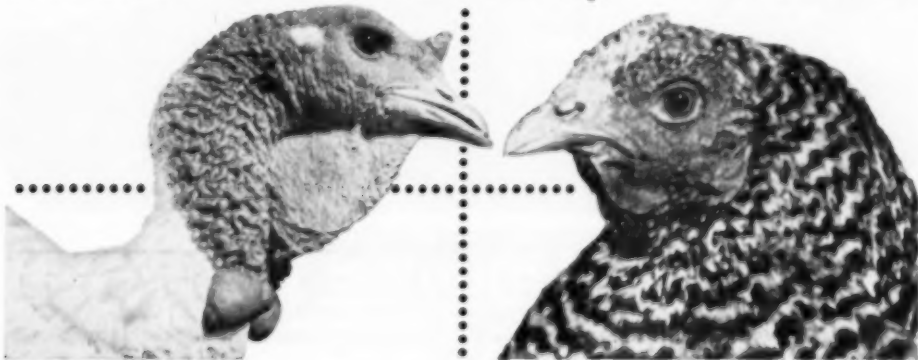
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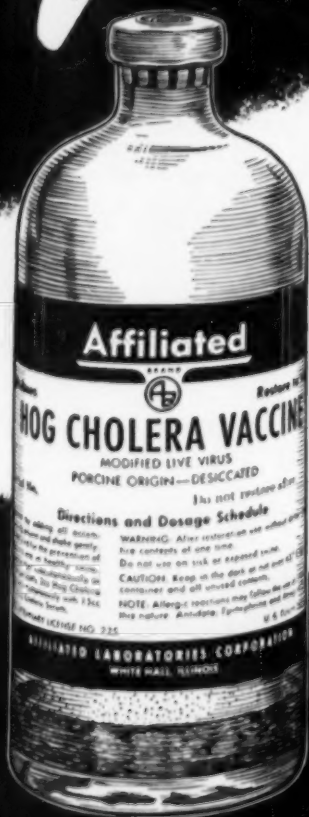


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VOL. 126

APRIL, 1955

No. 937

Mucormycosis in Food-Producing Animals A Report of Twelve Cases

C. L. DAVIS, D.V.M.; W. A. ANDERSON, D.V.M., M.S.;
B. R. McCrory, D.V.M., M.S.

Denver, Colorado

IN THEIR study of the differential diagnosis of bovine granulomas with special reference to tuberculosis, Davis and Anderson¹ have shown that there are a number of different infectious granulomas which in the chronic stage of development are often grossly indistinguishable from tuberculosis, thus requiring laboratory examination for correct diagnosis. This is especially true when lesions appear as yellowish, granular, caseo-calcareous or calcified granulomas.

The laboratory diagnosis of the different granulomatous conditions found in slaughtered animals is not only of interest from a meat-inspection standpoint, but also serves as a screening tool in many instances in the testing of cattle in the tuberculosis eradication program. For example, all lesions grossly resembling tuberculosis, found in untested cattle slaughtered under federal inspection, are required by the Meat Inspection Service to be submitted to designated federally operated laboratories for examination. If a suspected lesion proves to be tuberculous, the herd from which such an animal originated, if traceable, is subjected to the tuberculin test. As a result of this procedure, 741 tuberculin reactors were found in unsuspected herds in 1953. The origin of many tuberculous animals could not be traced, however, due to inadequate or no identifying marks.

It is significant, at least from an eco-

nomic viewpoint, that of 108 specimens submitted as suspected tuberculosis prior to 1951,¹ approximately 50 per cent proved to be other granulomatous conditions, thus avoiding the follow-up testing of these herds and saving considerable sums of money in both state and federal funds.

The more common infectious granulomas which were confused with tuberculosis were found to be coccidioidomycosis, actinobacillosis, or *Corynebacterium pyogenes* lesions. However, among 9 cases of unclassified mycoses in the entire 1951 series of 222 granulomas,¹ there were 5 which in tissue sections showed continuous, coarse, branching, nonseptate hyphae. Although the fungus appeared morphologically compatible with *Mucor*, we hesitated to make a diagnosis of mucormycosis because of failure to recover the organism in culture or to prove its pathogenicity in laboratory animals by direct inoculation of fresh material from two specimens. Also, the genus *Mucor* is considered by Conant² to be a common laboratory contaminant although it may be, but only rarely, a primary invader. Consequently, Conant advocated that the diagnosis of mucormycosis be made, "reluctantly and only when the evidence is overwhelming."

Since the fungus was present in tissue sections of closed lesions and neither acid-fast bacilli nor any other etiological agent could be incriminated, it was more than presumptive evidence that the mycelial forms were responsible for the necrobiotic

From the Animal Disease Research Laboratory, Animal Disease and Parasite Research Branch, ARS, U.S.D.A., Denver Federal Center, Denver, Colo.

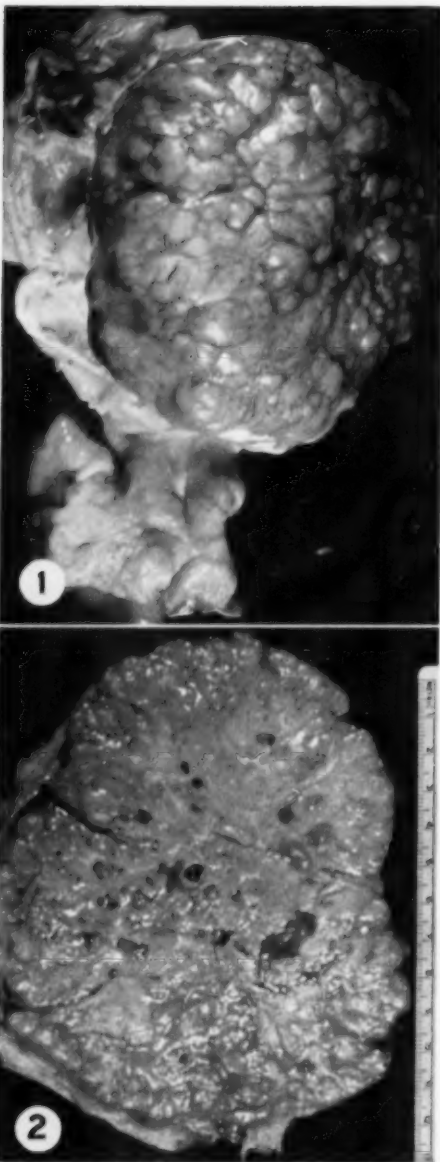


Fig. 1—A single bovine mesenteric lymph node lesion from which *Lichtheimia (Mucor) corymbifera* was isolated (case D 2812).

Fig. 2—Cut surface of lymph node shown in figure 1 which appeared as a greenish yellow caseocalcareous granulomatous process.

lesions. Furthermore, there was no evidence of a mixed infection in any of the cases.

FURTHER OBSERVATIONS WITH THE ISOLATION OF *lichtheimia (Mucor) corymbifera*

In the study, subsequent to our 1951 report, of nearly 300 additional bovine granulomas, 6 other animals with similar gross and microscopic findings were found. In addition, we have diagnosed by histological examination 1 porcine case which will be included in this report. From one of the six bovine specimens, a fungus was recovered in culture which was compatible with the textbook description of the genus *Mucor* and which was subsequently identified by an authority* as *Lichtheimia (Mucor) corymbifera*. He considered the isolation of some significance since, as he stated, "so many cases of mucormycosis lack culture data." The spores of the isolated fungus proved pathogenic for white mice by the intravenous method of exposure with the production of bilateral microscopic kidney lesions. The organism was consistently recovered in culture from the damaged kidneys, and mycelial forms, morphologically identical with those present in the original bovine mesenteric lymph node lesion, were readily demonstrable in the kidney sections of inoculated mice.

Mucormycosis in animals as well as in man has been previously described. For a comprehensive review of the literature, the reader is referred to an article by Gleiser³ who, in reporting 1 bovine and 2 canine cases, covers the subject quite thoroughly. The bovine case he reported was a contribution from the Denver Animal Disease Research Laboratory to the Registry of Veterinary Pathology, Armed Forces Institute of Pathology, and will be included among the bovine cases reported herein.

The purpose of this paper is not only to record 12 additional cases of mucormycosis in animals (table 1) but also to point out the difficulties in grossly differentiating the lesions of this disease from other bovine granulomas, particularly tuberculosis, or even from carcinomatosis. Of the 11 bovine cases, 5 were submitted as suspected tuberculosis, 3 as carcinomatosis, and 1 each as granuloma, coccidioidomycosis, and actino-

*C. W. Emmons, Ph.D., principal mycologist, National Microbiological Institute, National Institutes of Health, Bethesda, Md.

bacillosis. The single porcine case was submitted as suspected mycotic infection.

REPORT OF CASES

Since these cases are quite similar in both their gross and microscopic aspects, they will be treated as a group rather than individually. All 11 bovine cases were in beef-type animals, predominantly Herefords, ranging in age from 6 months to 5 years. While the 6-month-old calf and the 5-year-old cow were in fair to poor condition, the others, 8 steers and 1 heifer, were feedlot animals in good flesh at time of slaughter.

In table 1, showing the distribution of lesions, it is of interest that the 2 cattle and the hog which had a pulmonary involvement in addition to lymph node lesions showed loss of condition, presumably as a

result of the infection. A 2-year-old Hereford steer, showing only a solitary lung lesion, 6 by 6 by 4 cm., was reported in good condition. The occurrence in 3 animals of lesions in the mesenteric lymph nodes only, and in the others of pulmonary involvement alone or in combination with thoracic lymph node lesions, suggests the portal of entry to be either the digestive or respiratory tract. The bovine lesions were received from abattoirs located in Denver, Colo.; St. Joseph, Mo.; Los Angeles, Calif.; Sioux City, Iowa; Chicago, Ill.; and Helena, Mont.; the swine lesion, from Sioux City, Iowa.

With few exceptions, the lesions as observed at postmortem inspection were of a yellowish, granular, caseocalcareous consistency with a variable degree of scarring. The resemblance to a tuberculous process

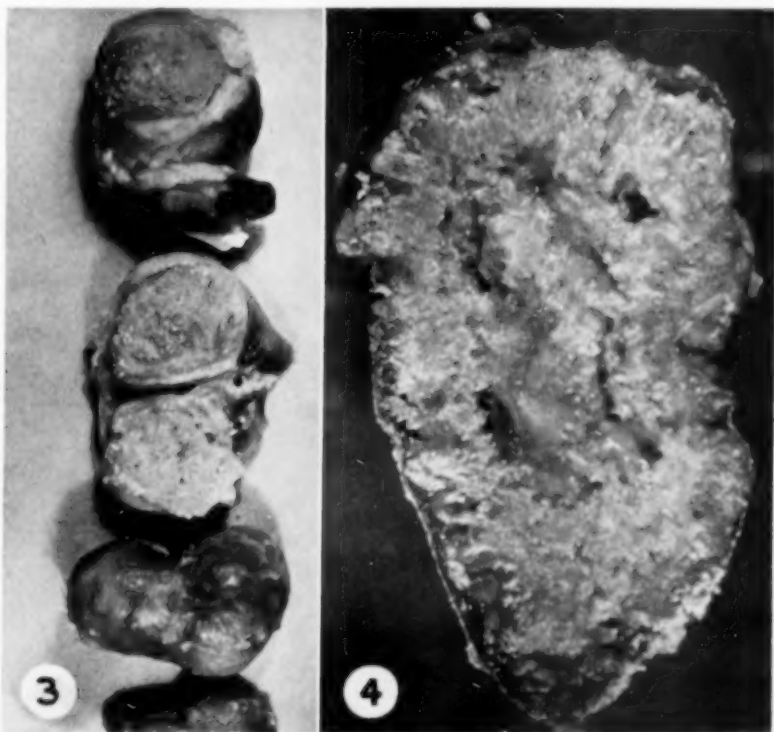


Fig. 3—Multiple mesenteric lymph node involvement from a bovine case. The lesions were yellowish, granular, and caseocalcareous with strong resemblance to tuberculosis (case D 1507).

Fig. 4—A yellowish, granular, caseocalcareous lesion in a bovine mediastinal lymph node (case D 1660).

TABLE 1—Postmortem Findings of Mucormycosis in Slaughtered Animals

Distribution of lesions of mucormycosis†										
Case No.	Species	Sex*	Age	Cervical lymph node	Bronchial lymph node	Mediastinal lymph node	Lung	Mesenteric lymph node	Iliac lymph node	Tentative postmortem diagnosis
D 1345	Bovine	F	5 yr.	.....	X	X	X	.....	X	Carcinomatosis
D 1486	Bovine	S	3 yr.	.....	.....	.....	.....	X	.....	Tuberculosis
D 1505	Bovine	F	1 yr.	.....	X	X	.....	.....	.....	Tuberculosis
D 1507	Bovine	S	2 yr.	.....	.....	.....	.....	X	.....	Actinobacillosis
D 1660	Bovine	S	3 yr.	.....	X	X	.....	.....	.....	Tuberculosis
D 1792	Bovine	..	6 mo.	.....	X	X	X	.....	.....	Carcinomatosis
D 2337	Bovine	S	2 yr.	.....	X	X	.....	.....	.....	Coccidioidomycosis
D 2674	Bovine	S	2 yr.	.....	.....	.....	X	.....	.....	Carcinomatosis
D 2683	Porcine	B	6 mo.	X	X	.....	X	.....	.....	Mycosis
D 2812‡	Bovine	S	18 mo.	.....	.....	.....	.....	X	.....	Granuloma
13221§	Bovine	S	2 yr.	.....	X	X	.....	.....	.....	Tuberculosis
D 3161	Bovine	S	15 mo.	.....	.....	X	.....	.....	.....	Tuberculosis

*S = steer, F = female, B = barrow. †Lichtheimia (*Mucor*) *corymbifera* isolated; §X = positive histological findings.

was so remarkable that it is no wonder that several of the specimens were submitted as suspected tuberculosis (fig. 1-4). The lymph node lesions were classified as either well marked or extensive and, in nearly all instances, the involved nodes were completely obliterated by the granulomatous process. Where portions of lymph nodes were still intact there was a tendency to encapsulation of the necrobiotic process. The larger and perhaps older lesions contained a greater

degree of scarring, particularly in the center, with the production of a more fibrous type of lesion.

MICROSCOPIC FINDINGS

Histologically, the bulk of the lesions consisted of masses of necrotic tissue containing scattered foci of calcification and occasional strands of connective tissue. Surrounding the necrotic mass were dense zones of inflammatory cells consisting of

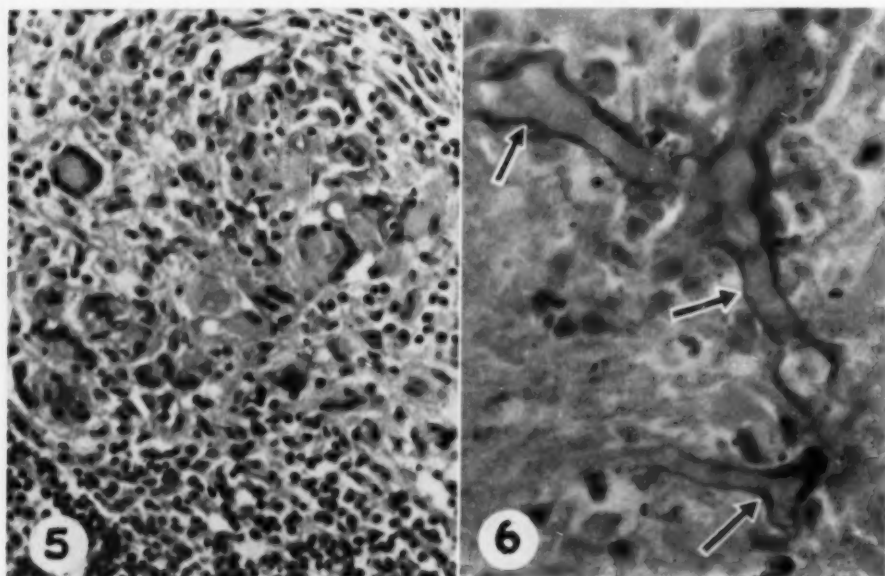


Fig. 5—A tubercle-like formation at the periphery of the necrotic tissue in a bovine mesenteric lymph node lesion (case D 2812). Hematoxylin and eosin stain, x 65.

Fig. 6—An area of necrosis in a bovine mesenteric lymph node (case D 2812) containing coarse, branching, nonseptate hyphae (arrows). Hematoxylin and eosin stain, x 500.

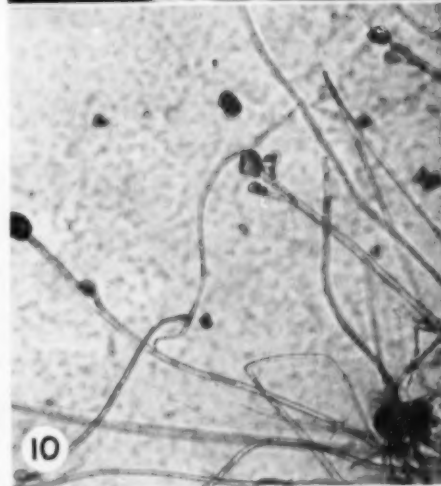
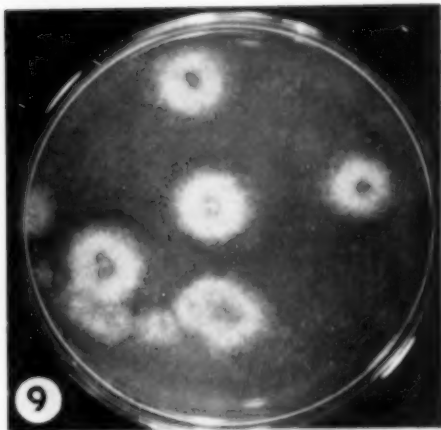
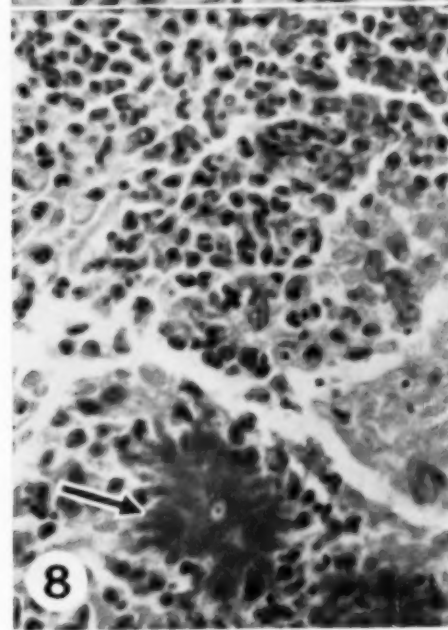
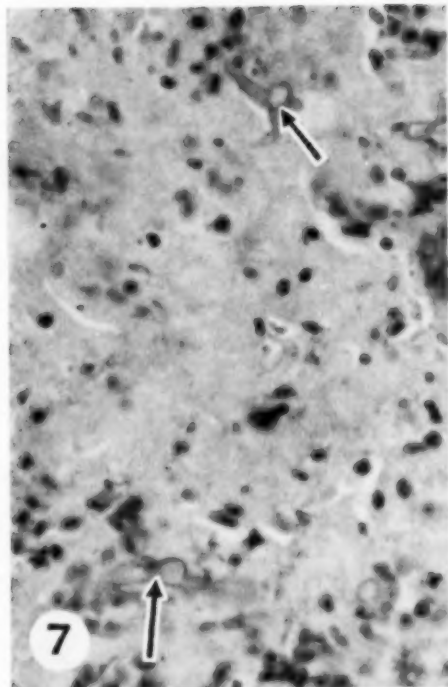


Fig. 7—Several hyphae (arrows), one showing branching, in a lymph node of a porcine case (case D 2683). Hematoxylin and eosin stain, $\times 300$.

Fig. 8—A rosette formation (arrow) in a granulomatous area in a lymph node (case D 2337), $\times 300$.

Fig. 9—A 42-hour growth, on Sabouraud's medium, of *Lichtheimia* (*Mucor*) *corymbifera* cultured from the kidney of a white mouse inoculated with the original culture isolated from the mesenteric lymph node in case D 2812.

Fig. 10—A hanging drop preparation of the culture showing nonseptate, branching sporangia bearing terminal sporangia.

lymphocytes, plasma cells, conspicuous numbers of eosinophils (usually absent in lesions of bovine tuberculosis), epithelioid cells, and many giant cells of the Langhans' type. Often the similarity to tubercle formation was striking (fig. 5). Within the necrotic tissue and often within the giant cells, coarse, branching, nonseptate hyphae characteristic of *Mucor* were readily demonstrable in hematoxylin and eosin-stained sections which were quite satisfactory for the purpose of diagnosis or for microphotography (fig. 6 and 7). However, to show the hyphae more clearly, special stains such as the methylene blue counterstain in Ziehl-Neelsen preparations or the Giemsa stain for tissue sections were employed. Gleiser recommends the periodic acid-Schiff staining method as best for the demonstration of *Mucor* in tissue sections.

In 2 of the 11 bovine cases, rosette formations were observed associated with the infectious process (fig. 8). Hyphae were seen within or in close proximity to the circular

rows of hyaline clubs. Therefore, mucormycosis can be added to the category of infectious diseases capable of provoking this peculiar type of tissue reaction in the form of hyaline clubs.

For purposes of rapid diagnosis and differentiation from other granulomatous conditions or even neoplastic tissue, we have utilized the touch-press preparation technique described by Davis and Anderson⁴ in demonstrating the hyphae in fresh tissue in three instances. Subsequent histological examination of the tissues confirmed the diagnosis of mucormycosis.

EXPERIMENTAL PROCEDURE

While each of the 12 cases reported revealed fungi in tissue sections that were morphologically compatible with *Mucor*, we were able to recover the fungus in culture from only 1 of 4 cases attempted. That isolation was made from a single, closed, mesenteric lymph node found in a well-conditioned, 18-month-old feedlot Hereford

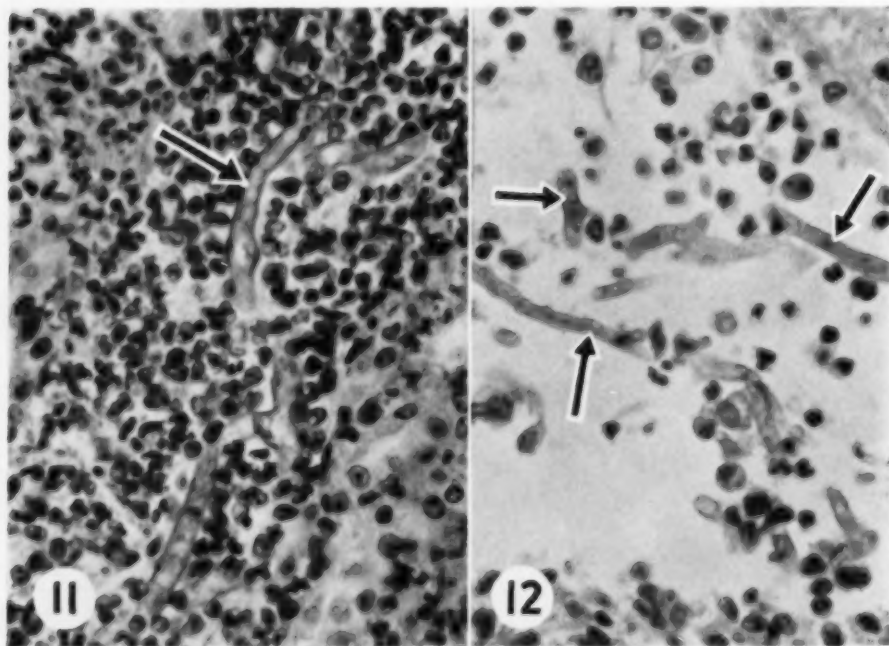


Fig. 11—Coarse, branching nonseptate hypha (arrow) in a suppurative kidney lesion of inoculated mouse. Hematoxylin and eosin stain, $\times 300$.

Fig. 12—Hyphae (arrows) in the renal pelvis of the same kidney as in figure 11. Hematoxylin and eosin stain, $\times 300$.

steer (case D 2812). The lesion was an irregular oval, lobulated mass measuring 12 cm. in diameter. The cut surface showed a greenish yellow, caseocalcareous, somewhat mottled granulomatous process separated from the uninvolved portion of the lymph node by a rather thin capsule (fig. 1 and 2). The fungus was readily demonstrable in tissue sections (fig. 6). A pure culture of fungus obtained on Sabouraud's medium had the morphological characteristics of *Mucor* sp. which was subsequently identified as *Lichtheimia (Mucor) corymbifera*. The fungus appeared on the culture medium as a small white growth of floccose aerial mycelium which grew rapidly and later turned dark gray (fig. 9). Hanging drop preparations of the culture showed nonseptate vegetative mycelium with branched sporangioophores of unequal length bearing terminal, globose, spore-filled sporangia (fig. 10).

The fungus proved pathogenic for 9 of 10 mice by intravenous inoculation of the spores using either 0.1 ml. or 0.2 ml. of a saline suspension. Death occurred between three and seven days with the 0.2-ml. dose and between seven and twelve days with 0.1-ml. injection. The fungus was recovered from the principal organs, but the kidney yielded the organisms most consistently. One mouse survived and was destroyed after forty-one days, but a positive culture of *Mucor* was nevertheless made from its kidney. There were no discernible macroscopic lesions in the inoculated mice but, on microscopic examination of the various organs, only the kidneys showed significant lesions in the form of suppurative foci. The fungus was present within some of the inflammatory areas as well as within the renal pelvis (fig. 11 and 12).

Similar kidney lesions were produced in a single rabbit which died in five days following an intravenous injection of 0.3 ml. of a saline suspension of the spores of *Mucor* isolated from the original bovine lesion. In addition, histological examination revealed microscopic suppurative lesions in the liver, spleen, and myocardium in which the fungus was readily demonstrable.

SUMMARY

1) A report is made of 1 porcine and 11 bovine cases of mucormycosis.

2) Involvement of mesenteric lymph nodes alone or thoracic lymph nodes and

lung suggests that infection can occur either by way of the digestive or respiratory tracts.

3) Grossly, the lesions have a strong resemblance to tuberculosis, requiring laboratory examination for differential diagnosis.

4) Coarse, branching, nonseptate hyphae morphologically compatible with *Mucor* were present in histological sections of closed lesions in all the cases.

5) In 2 bovine cases, rosette formations were found associated with the granulomatous process.

6) From one of the bovine lesions, a fungus was isolated in culture which was identified as *Lichtheimia (Mucor) corymbifera*. It proved pathogenic for white mice.

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Hereditary Alopecia in Cattle

Alopecia developed in 7 heifer calves in two Holstein-Friesian herds in England. The 4 in one herd were born with normal coats but at 6 weeks to 6 months of age alopecia started on the head and back, spreading to the quarters and limbs until some were completely bald. There was no disturbance in growth, in estrus, or in the skin, regardless of its color, and on necropsy all organs including the thyroid glands seemed normal. The hair follicles contained keratinized debris with no evidence of a growing hair shaft.

All were descendants, through their dam and sire, of bull A and were granddaughters on one or both sides of bull B, a grandson of bull A. Two of the 3 heifers in the second herd were known to be descendants of a bull from the first herd. Males might have been affected had they been retained. Apparently an autosomal recessive gene is involved.—Vet. Rec., Nov. 13, 1954.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

The Relative Bactericidal Activity of the Uterine and Body Cavities of Estrous and Pseudopregnant Rabbits

H. W. HAWK, M.S.; J. SIMON, D.V.M., Ph.D.; H. COHEN, D.V.M., M.S.;
S. H. McNUTT, D.V.M.; L. E. CASIDA, Ph.D.

Madison, Wisconsin

ESTROUS AND pseudopregnant rabbits respond differently as groups to uterine instillation of either semen contaminated with bacteria^{1,5} or a suspension of *Escherichia coli*.³ The inoculated uteri of estrous females exhibit little gross response to infection and only moderately increased leukocytic infiltration of the endometrium. However, they possess a highly effective defensive mechanism against the introduced organism, inasmuch as relatively few of the bacteria can be recovered twenty-four hours after inoculation. On the other hand, the inoculated uteri of pseudopregnant rabbits contain large amounts of pus in the lumens and the endometriums are infiltrated by great numbers of leukocytes, but the defense mechanism of these rabbits is inhibited to such an extent that large numbers of bacteria can be recovered twenty-four hours after inoculation. Similar differences in response to uterine infection have been reported in the estrous and luteal phases of heifers² and cows.⁶ It has been demonstrated that the inhibition of the defense mechanism in both pseudopregnant rabbits³ and cows⁶ in the luteal phase is due to progesterone.

An exception to the typical response of animals in the luteal phase to uterine infection has been observed in repeat-breeder

cows.^{2,4} The uteri of these cows do not respond to bacterial infection in the same way as maiden heifers in the luteal phase, the repeat-breeders showing much less of a gross response and greater bactericidal activity.

The purpose of this study was to determine whether progesterone inhibits the defensive mechanism only of the uterus or whether it causes some inhibition of the defenses of other parts of the animal body. Of further interest was the possibility that the results might suggest whether the difference between heifers and repeat-breeder cows in the luteal phase in resistance to bacterial infection of the uterus is a local or generalized difference.

EXPERIMENT 1—INOCULATION OF THE ABDOMINAL CAVITY

Methods.—The rabbits used were domestic females approximately 1 year old. Experimental pseudopregnancy was induced by mating estrous females to vasectomized bucks.

Three replicates of estrous and pseudopregnant rabbits were inoculated intraperitoneally with 2.5 ml. of a suspension of *E. coli* in sterile physiological saline solution. The numbers of bacteria per inoculum ranged between replicates from 3.15 billion to 4.475 billion cells. Preliminary work had indicated that some of the bacteria introduced into the peritoneal cavity migrated or drained through the oviducts into the uterus.

The rabbits were killed twenty-eight hours after inoculation, the skin removed from the abdomen, the skinned area disinfected with 70 per cent alcohol, a midventral incision made, and 25 ml. of sterile physiological saline solution was put into the abdominal cavity. The incision was then held shut with hemostatic forceps while the animal was shaken vigorously to cause the saline solution to bathe the abdominal viscera. Approximately 6 to 12 ml. of the saline solution was absorbed by the abdominal tissues during this process. The remainder was withdrawn with a sterile pipette and

From the Department of Genetics (Hawk and Casida) and Department of Veterinary Science (Simon, Cohen, and McNutt), University of Wisconsin, Madison. Mr. Hawk is an agent of the Dairy Husbandry Research Branch, U.S.D.A.

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the amount recorded. The uterus was taken from the abdominal cavity, the horns dissected apart, each horn flushed as aseptically as possible with 5 ml. of saline solution, and the flushings from the two horns were mixed. The washings from the peritoneal cavities and from the uteri were each plated serially on eosin-methylene blue agar, incubated at 37 C. for forty-eight hours, and the colonies of *E. coli* counted. Estimates of the total numbers recovered from the peritoneal cavities and uteri were then calculated.

Results.—The numbers of bacteria recovered from the peritoneal cavities of estrous and pseudopregnant rabbits did not differ greatly (table 1); the mean log of the numbers recovered from the peritoneal cavities of the estrous rabbits was 3.71, and from the peritoneal cavities of the pseudopregnant rabbits, 3.69. However, the numbers of bacteria recovered from the uteri differed greatly in the two endocrine states. The mean log of the bacterial numbers recovered was 4.71 from the pseudopregnant uteri, and only 0.69 from the estrous uteri, this difference being emphasized by the fact that no bacteria were recovered from seven of the ten estrous uteri.

The logs of the actual counts were used in the statistical analysis of the data. The log of the number of bacteria recovered from the uterus was subtracted from the log of the number recovered from the peritoneal cavity of the same rabbit. These location or "site" differences were then compared and a significant difference ($P < 0.01$) found between estrous and pseudopregnant rabbits, which indicated, in effect, a significant interaction between the endocrine state of the rabbit and the site of bacterial recovery.

These results fail to show a difference in the systemic response to infection of the estrous and pseudopregnant rabbits, even though the uteri of the two types responded differently. There was little reason to believe that more bacteria would find their way into the uteri of pseudopregnant than of estrous rabbits. The possibility remained, however, that fewer bacteria were recovered from the estrous uteri because of better drainage through the cervix. Previous work³ had shown that such drainage played a part in reducing the numbers of bacteria recovered from the uteri of estrous, but not pseudopregnant, rabbits.

The next experiment was designed to test more conclusively the suggestion that the differential response of estrous and pseudopregnant rabbit uteri was a local and not a generalized phenomena.

EXPERIMENT 2—INOCULATION OF THE PLEURAL CAVITIES AND THE UTERI

Methods.—The injection of a known number of bacteria directly into the uterus could be accomplished only by laparotomy of the animal. Since the reaction to this abdominal surgery might have interfered with the response to bacteria placed in the peritoneal cavity, the pleural cavity was used as a systemic site of inoculation in this experiment.

TABLE 1—Number of Bacteria Recovered from Peritoneal Cavities and Uteri of Rabbits Inoculated* Only in Peritoneal Cavity

Replicate	Type of Rabbit		Pseudopregnant	
	Estrous	Uterus	Peritoneal cavity	Uterus
	Peritoneal cavity			
I	1,780	0	3,400	2,250
	27,750	0	18,100	151,000
II	800	410	740	4,900
	570	20	160	6,500
	590	1,030	—	—
III	13,500	0	1,000	290,000
	22,500	0	11,000	290,000
	5,920	0	888,000	1,090,000
	104,000	0	—	—
	8,400	0	—	—

*Each inoculum contained 3.15 to 4.475 billion bacteria.

Four estrous and 4 pseudopregnant rabbits were laparotomized and both horns of each uterus were ligated at the cervix and at the tubo-uterine junctions. Each uterine horn was then inoculated with 0.1 ml. of an *E. coli* suspension by puncture of the uterine wall with a 24-gauge syringe, a total of 100 million bacteria being put in the uterus of each rabbit. At the same time, 4 ml. (2 billion bacteria) of the same *E. coli* suspension was injected into the pleural cavities of each rabbit, 2 ml. on each side, care being taken to insert the 20-gauge needle just through the thoracic wall so as not to damage the lungs.

The rabbits were killed twenty-eight hours later, the skin over the thoracic area removed, the area disinfected with 70 per cent alcohol, and an incision made with a pair of bone shears about 1 inch to one side of the midline and parallel to it. Then 10 ml. of sterile saline solution was put into that pleural cavity, the incision held shut with hemostatic forceps, the forequarters of the rabbit shaken to suspend the remaining bacteria in the saline, the fluid withdrawn with a pipette, and the amount recorded. The process was repeated on the other side of the rabbit and the washings from the two sides mixed. In most cases approximately the same amount of fluid or slightly more was withdrawn from the pleural cavities than was put into them. These washings and the uteri were handled in the same manner as described previously.

RESULTS AND DISCUSSION

The numbers of bacteria recovered from the pleural cavities of the estrous and pseudopregnant rabbits did not differ greatly (table 2). The mean log of the estimated numbers recovered from the pleural cavities of the estrous rabbits was 5.88, and from the same sites of the pseudopregnant rabbits, 6.22. However, as in the earlier replicates, the numbers of bacteria recovered from the uteri of the two types of rabbits differed considerably. The mean log of those from the estrous uteri was

5.14, and from the pseudopregnant uteri, 7.45.

The data were analyzed statistically by analysis of variance of the logs of the estimated numbers of bacteria recovered. The interaction between endocrine state of the rabbit and site of inoculation was highly significant ($P < 0.01$).

These results demonstrate that the differential response of estrous and pseudo-

two types did not differ, but several times more bacteria were recovered from the uteri of the pseudopregnant rabbits than from the estrous ones. The results indicate that the inhibition by progesterone of the defense mechanism of pseudopregnant rabbits is localized in the uterus and is not a generalized phenomena.

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Fertility and Ejaculation Interval

Semen collected from 14 dairy bulls at four-day intervals for 272 days averaged 5.7 billion motile spermatozoa per ejaculate. A similar collection from 16 other bulls at eight-day intervals averaged 7 billion. When the collection from the latter bulls was made twice on every eighth day, the average dropped to 5.7 billion sperms. Fertility tests showed no significant difference for these methods of collection. The second eighth-day ejaculate was as fertile as the first.—*J. Dai. Sci., Dec., 1954.*

Therapy for Trichomoniasis in Cows.—*Veterinariya* (Moscow) reports that a 1:1,000 aqueous solution of collargol,[®] when applied to the uterus and vagina daily for two weeks, eliminated *Trichomonas* infection without harming the animals.—*Vet. Bull., Nov., 1954.*

TABLE 2—Number of Bacteria (in Thousands) Recovered from Pleural Cavities and Uteri of Rabbits Inoculated in Both Sites*

Type of rabbit			
Estrous		Pseudopregnant	
Pleural cavity	Uterus	Pleural cavity	Uterus
205	35	1,740	52,000
605	370	1,170	7,500
1,900	400	643	4,900
1,440	67	6,010	325,000

*Each rabbit received 100 million bacteria in the uterine horns and 2 billion in the pleural cavities.

pregnant rabbit uteri to *E. coli* infection is traceable to a local and not to a generalized difference. Progesterone appears not to interfere with the systemic defense of the animal, but at the same time to inhibit the uterine defense mechanism. The mode of action of progesterone would appear to be on or through some factor peculiar to the uterus.

The results raise the question whether the difference observed between the uteri of repeat-breeder cows and of maiden heifers^{2,4} in the luteal phase in resistance to bacterial infection is a local rather than a systemic difference.

SUMMARY

The peritoneal cavities of estrous and pseudopregnant rabbits were inoculated with a suspension of *Escherichia coli*. No difference was found in the number of bacteria recovered from the peritoneal cavities of the two types of rabbits twenty-eight hours later; however, the numbers recovered from the uteri (resulting from self-inoculation per oviduct) of the two types of rabbits differed considerably, more bacteria being recovered from the uteri of the pseudopregnant rabbits.

Both the ligated uterine cornua and pleural cavities of estrous and pseudopregnant rabbits were then inoculated with a known number of *E. coli* organisms. The number of bacteria recovered twenty-eight hours later from the pleural cavities of the

Similarity of Equine Abortion and Equine Influenza Viruses

Colts 6 to 9 months old, when inoculated with Kentucky B strain of equine abortion virus, developed a leukopenia and mild respiratory symptoms similar to those of equine influenza. Then when equine fetuses were inoculated with two equine influenza viruses, abortions resulted with gross and microscopic lesions identical with those caused by equine abortion virus. Serological tests indicated that these viruses were closely similar or identical.—*Vet. Bull., Jan., 1955.*

Frozen Versus Unfrozen Semen Fertility

In six field trials comparing the fertility of bovine semen stored at 5 C. for one day with that of semen stored at -79 C. for periods of one day to fourteen weeks, the nonreturn or fertility rate was 71 per cent for 6,663 inseminations with the unfrozen and 59 per cent for 2,163 inseminations with the frozen semen.—*J. Dai. Sci., Dec., 1954.*

Sperm Count Following Vasectomy.—In hundreds of vasectomies in ten years, high sperm counts continued in four patients. In each one, it was found that in operating through the scrotal septum the same vas had been ligated twice and when the second vas was then ligated, the sperm count promptly dropped to zero.—*J.Am.M.A., Dec. 11, 1954.*

Cannibalism in Breeding Hens

Cannibalism may start when a baby chick on the range picks at another's toenails. The habit may then be transferred to relatively harmless feather picking when the birds are placed in a laying house. The most serious form of cannibalism apparently starts when the oviduct is abnormally everted or hemorrhage occurs as a result of a pullet laying her first eggs.

One breeding pen in which the females showed badly injured vents was watched. When a male was about to tread a hen, the cannibal (the only hen with a normal vent) dashed in and picked at the then open vent. How this habit was acquired may have been indicated in another pen where 2 birds fol-

lowed matings and apparently picked up droplets of semen from the litter. Scattering scratch feeds in the pens three to five times a day to increase the exercise which the hens must take may help, but "pick-guards" or debeaking may be necessary to control cannibalism.—*World's Poultry Sci., J., Oct., 1954.*

Spinal Anesthesia Sequela Report

Reports from 8,460 patients six months or longer after they had received spinal anesthetics, of whom 15.9 per cent had received them more than once, revealed that an incapacitating neurological disease had followed in only 1 instance and it proved to be due to a meningioma of the spinal cord, which had caused no previous symptoms. Headaches, suffered by 14 per cent, were the most common complaint.—*J.Am.M.A., Dec. 18, 1954.*

Success with Epididymal Semen

When 12 bulls which had been successful breeders were slaughtered, their intact scrotums were delivered to a laboratory in less than three hours. The secretion then recovered from each epididymis was added to a small volume of specially prepared homogenized whole milk, then glycerinated and refrigerated. When the resulting semen of 2 bulls was used it produced pregnancy in 8 of 12 cows. One cow conceived with semen frozen for eighty-three days, 7 other cows with samples frozen forty-nine to fifty-five days. The conception rate of 1 bull was as good as before he was slaughtered.—*Canad. J. Comp. Med., Nov., 1954.*

Vibriosis in Dairy Heifers

When virgin heifers were inseminated with semen from *Vibrio fetus*-infected bulls, or with uninfected semen to which organisms had been added, a median of five services was required for pregnancy. Their vaginal mucus agglutination titer, which was more accurate than their blood serum agglutination test, became positive in about sixty days and remained so for about seven months. Control heifers kept with the above remained healthy and required a median of slightly over one service per pregnancy. Most of the infected heifers had long estrous cycles of twenty-seven to fifty-three days.—*Vet. Bull., Jan., 1955.*

CLINICAL DATA

Studies on Bovine Leptospirosis. I. Some Effects of Dihydrostreptomycin and Terramycin on the Carrier Condition in Bovine Leptospirosis

LEIF M. RINGEN, Ph.D.; FRANK K. BRACKEN, D.V.M.; S. G. KENZY, D.V.M., Ph.D.;
R. W. H. GILLESPIE, Ph.D.

Pullman, Washington

ONE OF the major problems in controlling bovine leptospirosis is the elimination of the carrier condition. The majority of reports concerning the treatment of leptospirosis have dealt with changes which occurred in the clinical course of the disease, but not with the carrier state which resulted after apparent recovery. Dunn and Thompson¹ reported that experimental infections with *Leptospira icterohaemorrhagiae* in hamsters, guinea pigs, or dogs could not be eliminated with chloramphenicol, subtilin, or penicillin G. However, penicillin G was effective in protecting against lethal infections. Chang² found similar results when he studied the effect of penicillin against this microorganism in guinea pigs. He reported that penicillin will clear the blood, but not the liver, of leptospires. There was no apparent effect on the blood titers. Bruner and Meyer,³ in their experiments with hamsters and dogs, reported that streptomycin, but not penicillin, was successful in treating chronic renal infections. These workers used *Leptospira canicola* as the infecting agent.

The following investigation was made in an attempt to evaluate the effect of dihydrostreptomycin and terramycin® on leptospirosis produced by *Leptospira pomona* in cattle.

EXPERIMENTAL METHODS

Preliminary experiments were conducted in the field using 3- to 8-month-old Hereford calves.

From the Washington Agricultural Experiment Station, Department of Veterinary Microbiology (Ringen, Kenzy, Gillespie) and McCoy Clinic, (Bracken), College of Veterinary Medicine, State College of Washington, Pullman.

Scientific paper No. 1372, project No. 981. This investigation was supported in part by a grant from the Chas. Pfizer and Co., Inc., Terre Haute, Ind.

The experimental animals were selected on the basis of demonstrating leptospires in the urine by dark field examinations. These animals were treated by one injection on each of three successive days according to the following schedule: (1) 3 animals received 7 mg. of dihydrostreptomycin® intramuscularly per pound of body weight, and (2) 3 additional animals received a combination of 3 mg. of dihydrostreptomycin and 1 mg. of terramycin® intramuscularly per pound of body weight. Dark field examinations of the urine were made daily for three days, then at weekly intervals for five weeks, and a final examination was made after ten weeks. Young guinea pigs and hamsters were inoculated intraperitoneally with undiluted urine, but the results from these inoculations were not considered reliable. Subsequent experiments have shown that more consistent results were obtained when the urine was diluted. For this reason, in all subsequent experiments, the urines were immediately diluted (2:1) with buffered (pH 7.2) distilled water. To facilitate urine collections, only female animals were used.

The final experiments were conducted on yearling grade Herefords which were negative to the agglutination-lysis test⁴ six weeks prior to, and at the time of, exposure. This test, with *L. pomona* as the antigen, was used throughout the experiments. The cattle were exposed by placing in the conjunctival sac several drops of diluted urine immediately after it was collected from a calf with a known case of leptospirosis. The known case of leptospirosis was produced by the experimental infection of a calf with a recent isolation of *L. pomona*. This isolation was obtained from the urine of a cow and represented 1 hamster and one culture passage. The animal which served as the original source of this strain was from a herd in which leptospirosis was apparently enzootic, with some calves showing clinical evidence of infection including febrile response and, in some instances, death.

The first group of experimental animals was exposed twice, with a seven-day interval between ex-

*Obtained from Chas. Pfizer and Co., Inc., Terre Haute, Ind. Dosage levels used were suggested by this company.

posures, while the second group was exposed daily for five days. The thermal response was determined by taking rectal temperatures daily, and the serum antibody titers were determined by weekly blood tests.

Two methods were used when testing for leptospiruria: (1) daily examinations were made of the urine by direct dark field examinations, and (2) a rising titer demonstrated in recipient weanling guinea pigs and hamsters. All microscopic examinations were made without the use of a coverslip since it had been observed that leptospires may rapidly lose their motility in water or urine under a coverslip. Urine was collected at weekly intervals for laboratory animal inoculations; the guinea pigs received 4.0 ml. and the hamsters 0.5 ml. of diluted urine. These animals were inoculated intraperitoneally in duplicate, using a different animal for each inoculation. In some instances, leptospires were isolated from blood and tissues of these animals.

All of the experimentally infected animals were known to be excreting leptospires in the urine for six to seven days prior to treatment. Animal 1 was a field case (a 7-year-old Guernsey), so neither the beginning nor the end of the leptospiruria period was known. However, this animal aborted ten days prior to treatment, and leptospires were observed in her urine by dark field examination seven days after the abortion.

After leptospiruria occurred, animal 1 received 1 mg. of terramycin per pound of body weight in a single intramuscular injection daily for five days. When this did not prove effective, 3 additional animals were given 2 mg. per pound of body weight by single daily injection for five days. Four animals were treated with 5 mg. of dihydrostreptomycin intramuscularly per pound of body weight every twelve hours for three days.²

RESULTS AND DISCUSSION

Unpublished data from our laboratory on 8 experimentally infected control animals showed that when bovine leptospiruria occurred it lasted for at least twenty-one days in the majority of the animals. The antibiotic treatment of such cases was considered successful only if the leptospiruria was stopped during and after the administration of the drug. The dosage levels used in the field studies suggested that although they would reduce the numbers of leptospires being excreted, they would not regularly eliminate leptospiruria in cattle (table 1). Since the leptospiruria period prior to treatment in these field cases was not known, it is difficult to evaluate the effect of these levels. Some of these experimental animals may have been becoming noncarriers during their normal recovery period.

Subsequent experiments, under more controlled conditions, indicated that higher levels of dihydrostreptomycin, but not terramycin, will eliminate or markedly reduce bovine leptospiruria (tables 2 and 3). These results are based upon direct dark field examinations of the urine, together with laboratory animal inoculations. If the levels of terramycin had been increased, the findings might have been different. However, the level of terramycin excreted in the urine was much higher

TABLE 1—Field Studies on the Effect of Dihydrostreptomycin and Terramycin-Dihydrostreptomycin on Bovine Leptospiruria as Shown by Dark Field Examination of Urine*

Animal (No.)	Days post-treatment											
	0	2	5	7	11	14	19	20	27	34	71	79
Control												
70	4+	3+	—	2+	—	2+	—	2+	2+	2+	—	—
967	2+	3+	—	1+	—	2+	—	2+	—	—	—	—
1311	2+	2+	—	2+	—	1+	—	—	—	—	—	—
579	2+	2+	—	2+	—	—	—	—	—	—	—	—
969	1+	2+	—	—	—	—	—	—	—	—	—	—
985	1+	1+	—	—	—	—	—	—	—	—	—	—
Terramycin-dihydrostreptomycin												
911	4+	2+	—	—	—	—	—	—	—	—	—	—
935	4+	2+	—	— ^b	—	—	—	—	—	—	—	?
949	2+	—	—	(1+)	—	—	—	—	—	—	—	—
Dihydrostreptomycin												
918	2+	—	—	—	—	—	—	—	—	—	—	—
950	2+	—	—	—	—	—	—	—	(1+)	—	—	—
981	?	—	—	—	— ^b	—	—	—	—	—	—	—

*Terramycin-dihydrostreptomycin (intramuscularly) 1 mg. and 3 mg., respectively, per pound of body weight by one injection on each of three successive days. Dihydrostreptomycin (intramuscularly) 7 mg. per pound of body weight by single injection on three successive days.

4+ = Leptospires too numerous to count; 3+ = 10 to 20 leptospires per high power field; 2+ = 1 to 10 leptospires per high power field; 1+ = less than 1 leptospira per high power field; ? = forms resembling leptospires observed; (1+) = only 1 leptospira found in entire preparation; — = no leptospires found.

^bLeptospira isolated from blood of hamster inoculated with urine.

than that required to inhibit the growth of leptospiras *in vitro* (unpublished data). It may be that this antibiotic does not reach the leptospiras in the kidney tubules or does not remain there long enough to kill them. The latter is suggested by the fact that terramycin will reduce the numbers being excreted but will not completely eliminate them. This reduction occurred after the fifth day of treatment when the drug should be at its highest level. No difference in terramycin sensitivity was observed in a strain isolated after treatment, as compared with the strain used to infect these animals.

In contrast to the terramycin treatment, no evidence of leptospiuria was found after thirty-six hours of treatment with

dihydrostreptomycin. It is not known if the carrier condition had been completely eradicated since the kidneys from the experimental heifers have not been examined. However, this antibiotic will reduce, if not eliminate, the potentiality of these animals to spread the disease. Unpublished data from our laboratory suggest that approximately 750 leptospiras (*L. pomona*) per inoculum are required to infect 100 per cent of the guinea pigs inoculated. Since 4 ml. of diluted urine was used as an inoculum for these animals, probably less than 250 leptospiras per milliliter of urine were being excreted. It is of interest that the strain of *L. pomona* being used in these experiments was more sensitive to terramycin than dihydrostreptomycin when studied *in vitro*.

Treatment did not significantly reduce the blood serum titers, as measured by the agglutination-lysis test. However, treatment was initiated after the animals had developed a high titer.

The animals used in these experiments exhibited little clinical evidence of having the disease. A thermal response was elicited in all but 2 of the animals (1 of which showed no demonstrable leptospiuria). Several animals showed two distinct temperature elevations with a 24- to 48-hour period between the peaks.

That the incubation period varies with the size and route of the inoculation was observed in these experiments, as well as by other investigators.^{5,6} Repeated exposure resulted in a slightly shorter incubation period, as measured by the thermal response. The average incubation period for two exposures was sixteen days, as compared with thirteen days in the animals which were exposed daily for five days. The animals became serologically positive two to three days after the detection of fever, and leptospiras were demonstrated by dark field examination of the urines seven to twelve days later. Two animals failed to show any type of response after two inoculations with urine, but became serologically positive after five additional exposures at a later date. This suggests that some animals may normally have some degree of resistance to leptospirosis but, if the exposure is great enough, infection will occur.

Although all infected cattle do not excrete large numbers of leptospiras, they

TABLE 2—Effect of Terramycin on Bovine Leptospiuria

Animal (No.)	Time (days)	Leptospiuria as shown by		
		DF ^a	Guinea pig ^b	Ham- ster ^c
1 ^d	-3	4+	—	—
	0 ^e	2+	+	—
	+5	2+	—	—
	+6	—	—	—
	+12	—	+	—
	+46	—	+	—
26 ^d	-7	4+	+	+
	0	4+	+	+
	+5	4+	+	+
	+6	—	—	—
	+10	—	—	—
	+17	?	+	+
	+24	3+	+	+
	+31	2+	—	—
	+49	1+	—	—
27 ^d	-7	1+	+	+
	0	1+	+	+
	+9	1+	+	—
	+16	—	+	+
	+23	—	+	+
	+30 to 45	—	—	—
28 ^d	-7	1+	+	+
	0	2+	+	+
	+5	1+	+	+
	+6	—	—	—
	+10	—	—	—
	+17	—	+	+
	+24	—	—	—
	+31	1+	+	—
	+38 to 52	—	—	—

^aDark field examinations of diluted urine; 4+ = too numerous to count; 3+ = 10 to 20 leptospiras per high power field; 2+ = 1 to 10 leptospiras per high power field; 1+ = less than 1 leptospira per high power field; ? = forms resembling leptospiras observed; — = no leptospiras found.

^bGuinea pigs inoculated with 4 ml. of diluted urine.

^cHamsters inoculated (intraperitoneally) with 0.5 ml. of diluted urine.

^dSeven-year-old Guernsey received 1 mg. terramycin per pound of body weight in one injection daily for five days.

^eStart of treatment.

^fLeptospiuria determined by demonstration of a rising titer.

^gHeifers (approximate weight, 500 lb.) received 2 mg. per pound of body weight in one injection daily for five days.

present a problem in the control of leptospirosis, particularly because of the quantity of urine excreted by 1 animal. In the majority of cattle exposed in these experiments, a leptospiruria was demonstrable by direct dark field examinations of diluted urine. The urines were examined daily and, during the leptospiruria period, leptospiras could be seen in most of the examinations. Urine was collected from 1 animal four times in one hour and every hour thereafter for eight hours, with leptospiras being found every time. In some instances, large numbers were present. One sample contained 22,000,000 leptospiras per milliliter of urine. This animal (14, table 2) and 1 other (71, table 2) excreted this large number through five daily examinations. Leptospiras were found in the urine from animal 26 (table 2) every day from the nineteenth to the fiftieth day post-treatment. Leptospiras were also seen in the urine by direct dark field examinations for a total of forty-eight days and were demonstrated by laboratory animal inoculations for an additional sixteen days.

One experimentally infected pregnant cow aborted twenty-two days after the onset of fever, and large numbers of leptospiras were observed in the urine at the time of abortion. Placental retention occurred, with evidence of acute endometritis. The placenta was removed manually under procaine epidural anesthesia three days after the abortion. Treatment consisted of 2 Gm. of terramycin and 1 urea-sulfathiazole bolus *in utero*, and 3.0 mg. of diethylstilbestrol in oil, intramuscularly. In addition, 7 mg. of dihydrostreptomycin per pound of body weight was injected intramuscularly once daily for three days. There was no evidence of leptospiruria after the second day of treatment when the symptoms of endometritis subsided.

The fetus was about full term, with a good coat, and appeared to have died about two days prior to expulsion. The subcutaneous tissue contained large areas of sanguineous edema over the lumbar, scapular, and cervical regions. The thoracic and peritoneal cavities and the heart sac were filled with a sanguineous fluid while the abomasum contained a thickened hemorrhagic exudate with grayish particulate masses about $\frac{1}{8}$ inch in diameter. The pulmonary tissues were firm and sank in water. The pericardium was thickened with

TABLE 3—Effect of Dihydrostreptomycin on Bovine Leptospiruria*

Animal (No.)	Time (days)	Leptospiruria as shown by		
		DE ^b	Guinea pig ^c	Hamster ^d
14	-6	1+	+	+
	0	4+	+	+
	+0.5	4+	—	—
	+1.5 to 45	—	—	—
69	-6	1+	+	+
	0	2+	+	+
	+0.5	2+	—	—
	+1.5 to 45	—	—	—
71	-6	1+	+	+
	0	4+	+	+
	+0.5	4+	—	—
	+1.5 to 45	—	—	—
72	-6	1+	+	+
	0	2+	+	+
	+0.5	2+	—	—
	+1.5 to 45	—	—	—

*Five milligrams per pound of body weight every twelve hours for seventy-two hours. These animals were yearling heifers weighing approximately 600 to 650 lb.

^bDark field examinations of diluted urine: 4+ = too numerous to count; 2+ = 1 to 10 leptospiras per high power field; 1+ = less than 1 leptospira per high power field; — = no leptospiras observed.

^cGuinea pigs inoculated (intraperitoneally) with 4 ml. of diluted urine.

^dHamsters inoculated (intraperitoneally) with 0.5 ml. of diluted urine.

^eLeptospiruria determined by demonstration of a rising titer.

^fStart of treatment.

Note.—Animal 14 was excreting 22,000,000 leptospiras per milliliter of urine at the start of treatment; heifer 71 was excreting equivalent numbers.

a hemorrhagic edema. The liver exhibited areas of lighter coloration while the spleen and kidneys appeared normal.

Attempts to isolate *Leptospira*, both by laboratory animal inoculations and cultural methods, from the amniotic sac and thoracic and peritoneal cavities, failed. However, tissue sections from the liver and kidneys exhibited structures resembling leptospiras.

SUMMARY

1) The effect of terramycin® and dihydrostreptomycin on bovine leptospiruria was studied, employing field cases as well as animals experimentally infected with *Leptospira pomona*.

2) The results suggest that dihydrostreptomycin given intramuscularly at a level of 5 mg. per pound of body weight every twelve hours for three days eliminated the carrier state in 4 experimental animals during the period of observation. However, 7 mg. per pound of body weight given by one injection daily for three days reduced the numbers of leptospiras being excreted but did not regularly eliminate leptospiruria.

3) Terramycin, given intramuscularly at the 1- and 2-mg. levels per pound of body weight by one injection daily for five days, reduced but did not eliminate leptospirosis.

4) A combination of 1 mg. of terramycin and 3 mg. of dihydrostreptomycin per pound of body weight, given intramuscularly by one injection on each of three successive days, reduced but did not regularly eliminate bovine leptospirosis.

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National Poultry and Turkey Improvement Plans Revised

The Animal and Poultry Husbandry Research Branch of the ARS, U.S.D.A., recently announced revision regarding the National Poultry Improvement Plan (NPIP) and the National Turkey Improvement Plan (NTIP). Of interest in disease control are the following definitions: "Flock" means all the chickens on one farm except that it may mean a group which has been kept segregated for at least twenty-one days. A flock that is "U.S. Pullorum Typhoid Passed" is one in which no pullorum or typhoid reactors were found on the last official blood test. A flock that is "U.S. Pullorum Typhoid Clean" is one in which no pullorum or typhoid reactors were found on two consecutive blood tests, and

to sell hatching eggs or chicks in this classification, all eggs and chicks handled must meet these requirements. The official blood tests shall be the standard tube agglutination test, rapid serum test, or stained antigen rapid whole blood test done by an authorized agent. Reactors may be submitted for postmortem and bacteriological examination and if no infection is demonstrated, the flock will be considered clean.—*Fed. Register*, Oct. 9, 1954.

Interpreting the Brucellosis Test

A study by the Animal Disease Parasite Research Branch, Agricultural Research Service, Beltsville, Md., indicates that one additional dilution positive should be allowed cattle vaccinated as calves with strain 19 vaccine when interpreting the serum-agglutination brucellosis test. Thus, a titer of 1:100, which is considered positive for others, would be interpreted as suspicious for the vaccinated animal.—*U.S.D.A.*

Neoplasia in the Dog

A survey of neoplasia in the dog disclosed that in a series of 1,018 tumors, 1.48 per cent occurred in dogs less than 1 year old; 23.98 per cent occurred in dogs 1 to 5 years old; 50.2 per cent were in dogs 5 to 10 years old; 23.78 per cent in dogs 11 to 15 years old; and 0.58 per cent in dogs 15 years of age.

The breed incidence indicated that sarcomas of the leg bones occurred in the larger breeds, such as Great Danes; melanomas and perhaps lymphosarcomas occurred more frequently in Scottish Terriers; and Boston Terriers had a high incidence of mast cell tumors. A negative susceptibility to tumors seemed to exist in certain breeds.

Apart from tumors of the sex organs, sex seemed not to play a part in the incidence of canine neoplasms except perhaps for tumors of the parietal glands which were observed more frequently in the male. The most common and important malignant tumors encountered were sarcomas and carcinomas of the skin, melanomas of the skin and mouth, carcinomas of the mammary glands and, in particular, carcinoma of the tonsils, lymphosarcoma of the intestines, sarcoma of the bone, and lymphatic leukosis.—*Vet. Rec.*, Dec. 25, 1954.

Some Observations on Carriers of Equine Infectious Anemia

C. D. STEIN, V.M.D.; L. O. MOTT, D.V.M.; D. W. GATES, V.M.D., M.S.

Beltsville, Maryland

THE OUTBREAK of infectious anemia among Thoroughbred horses at the race tracks in New England during the summer of 1947^{1,2} focused attention for a time on the insidious nature of the disease and the importance of carriers as a factor in its perpetuation. Since the occurrence of this outbreak, practicing veterinarians have been on the lookout for the disease, and sporadic but unconfirmed cases have been reported to the former Bureau of Animal Industry (Agricultural Research Service) from at least 20 states. Subsequent to the New England outbreaks, Bureau investigators isolated the virus from a horse in Kentucky in 1948 and from an outbreak in Nebraska in 1950.

The introduction of the disease in breeding establishments and in army horses in various parts of the world has been traced to carriers. Furthermore, outbreaks reported in horses at biological establishments in a number of countries are additional proof of the important role played by carriers in spreading the disease. Such outbreaks have been reported by Griffin and Brose³ in the United States, by DeKock⁴ in South Africa and, more recently, by Todd⁵ and Fortner⁶ in several plants producing biological products in Germany. Records on file in the Department indicate that during the last three decades suspected outbreaks have been reported from a number of biological establishments in the United States.

Although equine infectious anemia may occur in an acute or subacute form, it is essentially a chronic disease. Following an outbreak in a group of horses, a few of the most susceptible animals may die of the acute or subacute form, but there is a marked tendency for the disease to assume a mild chronic form following the initial attack and one or more febrile reactions. However, most investigators agree that animals affected with any form of the disease may apparently recover but remain carriers of the virus for long periods. Such

cases, which represent the inactive form of the disease, are commonly designated as symptomless or clinically recovered carriers. While it is generally believed that animals that make an apparent recovery from the disease may harbor the virus for years, a difference of opinion exists as to whether or not an animal when once infected remains a carrier for life.

DeKock⁴ reported that all clinically recovered cases under his observation retained their power to infect and cited one instance in which the blood was still fully virulent seven years after the last attack. However, the same author presented evidence that blood of a carrier may not be infectious at all times. The Japanese Commission⁷ found the blood of carriers infective three to four years, but not five years, following original infection. They concluded that in carriers the virus gradually loses its virulence and finally disappears.

Kral *et al.*⁸ reported the disappearance of the virus for five years from the blood of 2 recovered horses and for one and one-half years from the blood of a third horse, after which it again was proved to be infectious. After testing the blood of numerous clinically recovered horses, they concluded that it is doubtful whether complete recovery with disappearance of the virus ever occurs in any case. Kaljakow⁹ reported that horses that acquired the infection during an outbreak in Russia in 1932 were still carriers twenty to thirty months later. He also mentioned that Russian workers have observed the disappearance of the virus in affected horses between febrile attacks. He cited 1 such case in which the blood was found to be nonvirulent two months and ten days following a febrile attack. The same author reported that some Russian workers had offered the unique theory that relapses in so-called "recovered" cases are in reality only reinfections.

On the other hand, at least five instances have been reported in the literature in which infected horses remained virus carriers for exceedingly long periods.

Schalk and Roderick¹⁰ reported a clinically recovered case, experimentally infected in 1908, which remained a carrier until 1922. During this fourteen-year period, 18 horse-inoculation tests made at frequent intervals on the blood of the carrier all gave positive results.

Scott¹¹ reported a case of infectious anemia produced experimentally in an 18-year-old horse in 1915. This animal, although continuously infected with the disease for approximately fifteen years, as demonstrated by horse inoculation tests, lived to be 33 years old.

Heath,¹² reporting on transmission experiments carried on apparently during 1930, presented evi-

From the Animal Disease and Parasite Research Branch, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (Stein), and Beltsville, Md. (Mott and Gates).

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dence that the blood from an immune carrier (a mare originally infected in 1912), when injected intravenously into normal horses, produced infectious anemia in the subacute form.

Kral,¹³ in a recent article, also reported that the blood of 14 recovered carriers was continually capable of causing the disease when repeatedly injected into healthy horses. Some of these carriers were held under observation as long as twelve years.

Mitchell, Humphreys, and Walker¹⁴ reported that observations on carriers during studies of the disease in Canada for twenty-five years indicate that such animals rarely recover from the disease. Blood taken from carriers many years after they appeared normal was capable of infecting healthy horses.

During the BAI's investigations of different aspects of infectious anemia from 1935 to 1954, a large number of horses were experimentally infected. Due to insufficient stable space and the high cost of maintenance, most of the horses with nonfatal infection were disposed of after they had served their purpose and were no longer of value in the experiments. However, a comparatively small number of infected animals were held under observation for periods varying from five months to eighteen and one-half years. These served as a source of active virus and were used for further studies reported in this paper.

These animals were kept in well-ventilated, screened, isolated stables provided with concrete floors and screened vestibules. Temperatures of all the infected horses were recorded at least twice daily. The animals were well fed and cared for. They were groomed from time to time and their feet were trimmed when necessary. None were required to work and no special provision was made for exercise. They were removed from the stable only when they were transferred to other barns or when they were taken out for inspection or to be photographed.

VIRUS CARRIERS OF LONG STANDING

History of Carrier 856.—Horse 856, a 15-year-old, alert, active, nervous gelding, weighing about 1,100 lb. and in excellent condition, was injected subcutaneously between Feb. 18 and March 27, 1935, with six samples of horse serum suspected of being infected with the New York strain of virus.

On April 17, 1935, twenty-one days after the last injection of serum, the animal developed symptoms of infectious anemia, characterized by a rise in temperature, depression, poor appetite, unsteady gait, and congestion of the visible mucous membranes. The attack lasted four days, during which the temperature reached a maximum of 107.0 F. For a time afterward, there was a gradual loss of flesh followed by one slight temperature rise to 101.6 in June, but he made an apparent recovery.

On Oct. 4, 1935, when in excellent condition but considered to be a carrier, he was again exposed to the New York strain of virus 884 to test

his resistance to it. Nine normal horses exposed to the virus at the same time all developed an acute fatal form of the disease, whereas horse 856 had only two mild febrile reactions—one in October and one in December, with a maximum temperature of 102.6 F. These mild reactions indicated that he was a carrier, since such an animal usually shows little or no reaction to injections of virus. From January, 1936, to Oct. 4, 1940, he remained normal and had no temperature exceeding the maximum normal of 101.0 F.

On October 4, horse 856 was injected with an antigen prepared from the dialyzed acetone-precipitated whole globulin derived from virulent serum and gave a positive immunological reaction to the test. Following injection of the globulin, a rise in temperature occurred in twenty-four hours, which persisted for four days and reached a maximum of 106.4 F. After October 9, his temperature never exceeded 100.0 F. until June 7, 1945, when a mild febrile attack occurred which persisted for seven days, the maximum temperature being 102.8 F. After June 15, 1945, no further temperature reactions occurred until May 16, 1951, when a final flare-up persisted for ten days, with a maximum of 103.4 F. On May 30, 1951, four days after this attack, the animal died.

During the thirteen-year period from January, 1936, to the summer of 1949, horse 856 remained in excellent physical condition except for the temperature reactions mentioned (fig. 1, A and B). However, late in the summer of 1949, when about twenty-eight years old, he began to manifest indications of senility. There was a gradual loss of flesh and posture and he became less alert and active. By the summer of 1950, the loss of weight was pronounced, his coat was lusterless and harsh, and the general appearance was that of an aged horse. During this period, his appetite was fairly good but the loss of flesh continued and the temperature remained normal until the final febrile attack on May 16, 1951. Following this attack, he gradually grew weaker, there was partial inappetence and he was finally unable to maintain a standing position; on May 29, 1951, he became moribund, and on the following day he died (fig. 1, C).

Postmortem examination revealed the following: poor condition, with a marked loss of adipose tissue; lungs and pleura, normal; heart, a pale and parboiled appearance; numerous petechiae on the epicardium, especially along the coronary blood vessels; ecchymotic areas in the myocardium; scattered subendocardial hemorrhages, especially in the ventricles and on the heart

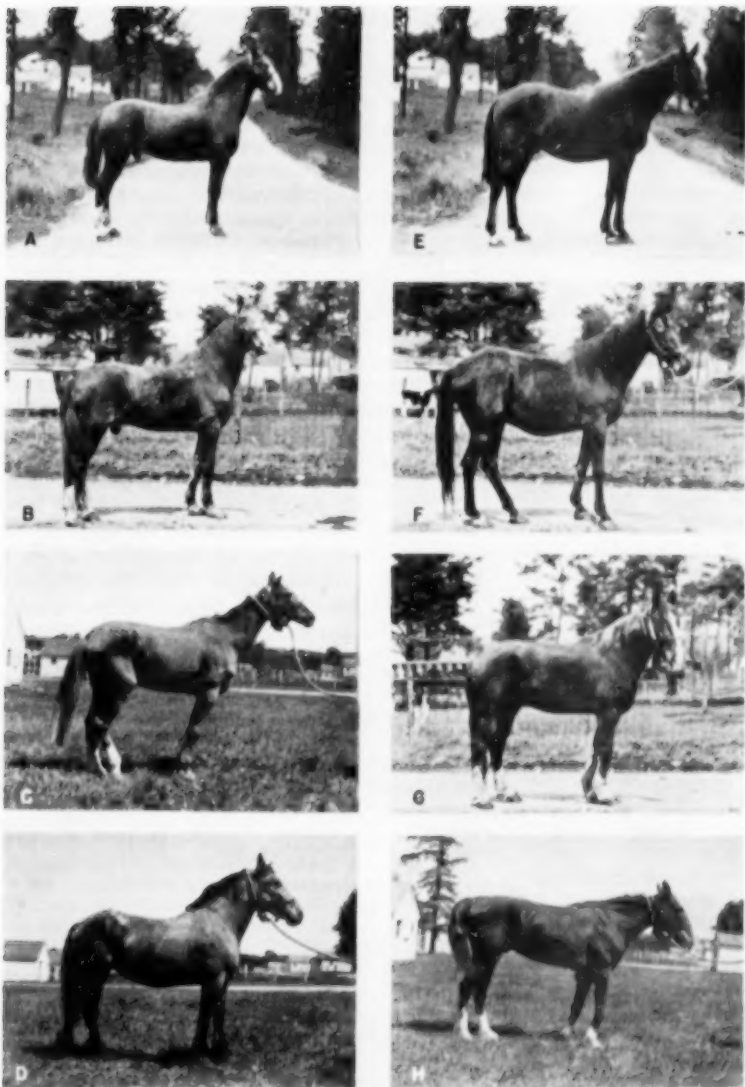


Fig. 1—Carriers of infectious anemia.

- (A) Carrier 856, more than three years after being infected with New York virus, appears normal in all respects.
- (B) Carrier 856, eleven years after date of infection and still in excellent condition.
- (C) Carrier 856, fifteen years after date of infection, showing loss of flesh and muscular tone. Its poor condition is due to senility.
- (D) Carrier 1410 three years after infection with New Hampshire virus isolated direct from outbreak in race horses in 1947. This animal appears normal in all respects.
- (E) Carrier 884 in excellent condition two and one-half years after original infection with New York virus. (F) Carrier 884 ten and three-fourths years after infection and still in good condition.
- (G) Carrier 1295 in excellent condition four and one-half years after being infected by horsefly bites (Wyoming virus). (H) Carrier 1295 nine years after original infection and two years after losing carrier state. Its poor condition is due to senility.

valves; diaphragm, normal; liver, pale yellowish brown, enlarged, congested and friable; spleen, slightly enlarged, pulp dark but firm and numerous petechiae on the surface; kidneys, pale, edematous and friable with scattered petechiae in the cortex and with ecchymotic areas in the renal adipose tissue; and the mucosa of the bladder thickened, with a few ecchymotic areas. The stomach and intestines were normal.

Histopathological examination revealed the following alterations: The liver cords were moderately atrophic and the hepatic sinusoids were dilated. Both the sinusoids and the central veins contained a considerable excess of lymphocytes and larger cells of the monocyte type. There also were scattered focal aggregates of reticulo-endothelial cells in the hepatic sinusoids, typical of the so-called "disseminated nodules" of infectious anemia. There was, however, no appreciable excess of hemosiderin in the liver tissue. The spleen tissue was moderately congested and contained a considerable amount of hemosiderin. The heart sections examined showed hemorrhage in the myocardium and endocardium. No significant pathological alterations were seen in the kidney sections. Despite the absence of hepatic hemosiderosis, the combination of pathological changes in the liver, spleen, and heart is character-

istic of a recent reaction to the virus of infectious anemia.

Examinations at irregular intervals indicated that the blood picture of horse 856 was well within the normal range except during and after febrile attacks, when there was a moderate decrease of erythrocytes and hemoglobin and a reduction in the red cell volume.

During the sixteen years of observation, his blood was tested at irregular intervals for the presence of virus by inoculation of susceptible horses. Such tests were made 16 times with the use of 23 susceptible horses, all of which developed symptoms of the disease. The results (table 1) indicate that his blood remained virulent for more than sixteen years. However, about two and one half years after infection, his blood appeared to decrease in virulence as 18 of the 20 susceptible horses inoculated subsequent to that time developed the disease in a chronic form, whereas the 3 horses injected prior to that time developed the acute or subacute form (table 1).

Other Experiments Carried Out on Carrier 856.—During his sixteen-year observation period, horse 856 was used in a number of experiments which it is believed in no way affected his status as a virus carrier.

From June 10 to June 25, 1937, shortly

TABLE 1—Results of Subcutaneous Horse Inoculation Tests of Blood of Carrier 856

Test (No.)	Date	Approx. time since horse 856 was infected		Test horse (No.)	Amount injected (cc.)	Date reacted	Incubation period (days) ¹	Form of disease ²	No. of febrile attacks	Remarks	Duration of illness (days)
		(years)	(months)								
1	3/12/37	1	11	998	50	4/7/37	26	Subacute	14	Died 7/18/37	102
2	7/7/37	2	3	1037	50	7/24/37	17	Acute	2	Died 8/4/37	11
3	10/21/37	2	6	993	50	11/3/37	13	Subacute	13	Died 2/15/38	104
4	12/4/37	2	7	1062	50	12/23/37	19	Chronic	4	Died 3/15/38	82
5	9/9/40	3	4	1224	100	9/24/40	15	Chronic	2	Killed	.....
5	9/9/40	3	4	1190	100	9/22/40	13	Chronic	2	Killed	.....
6	7/7/41	6	2	1123	50	7/23/41	16	Chronic	9	Died 6/8/42	310
7	4/15/42	6	11	1340	10	5/7/42	22	Chronic	1	Killed	.....
8	5/15/42	7	0	1318	25	5/30/42	15	Chronic	4	Killed	.....
8	5/15/42	7	0	1319	25	6/23/42	39	Chronic	2	Killed	.....
8	5/15/42	7	0	1116	25	6/10/42	26	Chronic	6	Killed	.....
8	5/15/42	7	0	1351	25	5/29/42	14	Acute	3	Killed	.....
9	11/5/42	7	6	1016	50	11/22/42	17	Chronic	2	Killed	.....
10	12/2/43	8	7	1376	100	12/19/43	17	Chronic	7	Died 11/20/44	336
10	12/2/43	8	7	1374	100	12/20/43	18	Chronic	15	Killed	.....
11	1/6/45	10	1	1367	100	1/20/45	14	Chronic	6	Died 12/24/45	338
11	1/6/45	10	1	1373	100	2/21/45	46	Chronic	18	Killed	.....
12	4/24/46	11	0	1385	200	5/12/46	18	Chronic	3	Killed	.....
13	2/24/48	12	9	1368	100	3/15/48	17	Chronic	2	Killed	.....
14	4/20/49	14	0	1420	100	5/2/49 ³	12	Subacute	6	Killed	.....
15	8/18/50	15	3	1449	100	9/7/50	20	Chronic	2	Killed	.....
15	8/18/50	15	3	1473 ⁴	1,000	9/5/50	18	Chronic	6	Killed	.....
16	6/5/51 ⁵	16	1	1470	60	6/21/51	16	Chronic	5	Killed	.....

¹Blood collected from horse 856 on May 24, 1951—six days previous to death. ²This animal was inoculated intravenously. ³Blood serum from horse 1420 lyophilized on May 21, 1949, was still virulent when tested on March 20, 1952. ⁴The incubation period in the test horses varied from twelve to forty-six days. ⁵Only 5 of the 23 test horses inoculated with blood from carrier 856 developed an acute or subacute form of the disease while 18 of the test horses developed a chronic form of the disease.

after inoculation tests had indicated he was still a carrier, he received a series of intravenous injections of fuadin® (stibophen), a preparation of sodium antimony, in an attempt to eliminate the virus from the body tissues. Although he received 472 cc. of a 6.3 per cent solution intravenously in eight injections, the results were negative; he continued to harbor the virus.

From Sept. 9, 1940, to May 27, 1941, in a series of tests, he was injected with seven antigens prepared from whole serum globulins or urine from infected horses, as well as U. S. tuberculin, in an attempt to provoke an acute reaction. In only one instance did such a reaction occur. Apparently the process used in the preparation of antigens from the serum and urine of infected horses caused their inactivation as they failed to produce active symptoms of infectious anemia when injected into normal control horses.

History of Carrier 884.—Horse 884, a 9-year-old gelding, weighing about 1,000 lb., active and in excellent condition, was inoculated subcutaneously on Aug. 2, 1935, with 100 cc. of pooled virulent blood serum from horses 874 and 878 experimentally infected with the New York strain of virus.

Thirteen days following the injection, horse 884 developed clinical symptoms of acute infectious anemia characterized by a rise in temperature, inappetence, muscular weakness, general depression, and congestion and icterus of the visible mucous membranes. The initial febrile attack persisted for five days with a maximum temperature of 106.4 F., and was followed by four intermittent febrile reactions on August 26, September 7, October 11, and October 17. During these attacks, there was a gradual loss of flesh, but after the active symptoms had subsided the animal made an apparent recovery. From November, 1936, to January, 1944, his physical condition was excellent, and aside from a number of mild temperature reactions ranging from 101.2 to 101.8 F., he showed no symptoms of the disease. On Jan. 25, 1944, a febrile attack occurred which lasted nine days, the maximum temperature being 104.2 F. After recovery, he remained well until May 22, 1946, when a four-day febrile attack occurred, with a maximum temperature of 105.2 F. On Aug. 16, 1946, he had a one-day temperature of 102.0 F., then he remained normal until Sept. 16, 1949, when he had a three-day attack, with a maximum temperature of 102.2 F.

There were no further temperature reactions in this animal up to Sept. 20, 1954, the last date of observation.

No evidence of progressive anemia developed in this animal, his blood picture being normal except during the intermittent febrile attacks when there

was a moderate reduction of erythrocytes, hemoglobin, and red cell volume and an increase in sedimentation rate.

During the first fifteen years that carrier 884 was held under observation, he remained in excellent condition, except for the febrile attacks mentioned above (fig. 1, E and F). However, during the last three and one-half years, he gradually manifested indications of senility, such as loss of flesh and posture and a marked decrease in alertness and activity. During September, 1954, the physical condition of carrier 884 became progressively worse and the animal became moribund on September 20, and was destroyed. As is frequently observed in carriers that die without a final flare-up of symptoms, no characteristic lesions or pathological alterations of equine infectious anemia were found on postmortem. Although infected for more than eighteen years, he had lived to be approximately 28 years old.

Fourteen horse-inoculation tests made at irregular intervals from October, 1935, to April, 1954, with the blood of carrier 884 resulted in transmission of the infection to all of 28 susceptible horses, indicating that the blood remained virulent for approximately eighteen years and six months. A normal horse subinoculated with blood from the animal infected on June 5, 1951, developed symptoms of infectious anemia in twenty days. Five carrier cases of infectious anemia which are usually resistant to reinfection showed little or no reaction when injected with blood from carrier 884 (table 2).

The blood of carrier 884, like that of carrier 856, appeared to decline in virulence with the passage of time. Blood samples collected up to five and one-half years following the date of his infection produced a high percentage of acute and subacute cases in the test horses, whereas the samples collected eleven years after infection induced most often a mild chronic type of the disease. The last blood sample from carrier 884, collected April 6, 1954 (eighteen and one-half years after the original date of infection), produced a subclinical infection when injected into normal horse 1532. Blood from 1532, when subinoculated into normal horse 1536, produced a subacute infection.

Other Experimental Work on Carrier 884.—Carrier 884 also was used in other experiments during the time he was held

under observation. Horse-inoculation tests carried out a short time prior to these studies demonstrated that his blood was virulent. It is believed that the following experiments in no way altered his status as virus carrier.

In a series of tests, carrier 884 was injected with antigens prepared from blood serum globulins of infected horses. Injections of globulin antigens were made on the following dates in 1940: April 8, May 20, September 9, October 4, December 4, and December 19; also on March 10, 1941, and April 26, 1944. An injection of mallein was administered on March 19, 1941, and an injection of triple typhoid vaccine, type 1940, on May 23, 1946. However, none of the above antigens produced a typical reaction of infectious anemia.

To test the resistance of carrier 884 to reinfection, he was injected subcutaneously on May 27 and August 13, 1941, with filtered Wyoming virus strains 1298 and 1320, and on May 15, 1942, with defibrinated blood from horse 1324 infected with the

California strain of virus. He showed no reaction to these injections.

VIRUS CARRIERS OF SHORT STANDING

During our studies on various aspects of the disease, we have had under our observation for varying periods a considerable number of inactive cases in horses that made an apparent recovery, but that continued to harbor the virus.

A summarized history on 13 cases of this nature that were proved by horse-inoculation tests to be carriers for five to forty-eight months following infection are shown in table 3.

CARRIERS WITH SUBCLINICAL INFECTION

In areas where the disease is enzootic, the native horses and mules appear to develop a tolerance for the infection. Many of the animals in such areas are affected with a mild chronic or subclinical form and are inapparent carriers. However, when fully susceptible horses are brought into such areas and placed in contact with na-

TABLE 2—Results of Subcutaneous Horse Inoculation Tests of Blood of Carrier 834

Test (No.)	Date	Approx. time since horse 884 was infected (days)	Test horse (No.)	Amount injected (cc.)	Date reacted	Incubation period (days) ¹	Form of disease ²	Remarks	Duration of illness (days)
1	10/4/35	49	877	100	10/15/35	11	Acute	Died 10/30/35	15
	10/4/35	49	888	100	10/16/35	12	Acute	Died 10/27/35	11
	10/4/35	49	308	100	10/13/35	9	Acute	Died 10/29/35	16
	10/4/35	49	751	100	10/16/35	12	Acute	Died 11/3/35	18
	10/4/35	49	750	100	10/18/35	14	Acute	Died 10/29/35	11
	10/4/35	49	801	100	10/14/35	10	Peracute	Died 10/21/35	7
	10/4/35	49	882	100	10/15/35	11	Acute	Died 11/6/35	22
	10/4/35	49	875	100	10/15/35	11	Chronic	Killed	—
	10/4/35	49	879	100	10/14/35	10	Acute	Died 10/28/35	14
	10/4/35	49	876	100	10/14/35	10	Acute	Died 10/29/35	15
	10/4/35	49	764 ^a	100	None	—	Carrier	Killed	—
	10/4/35	49	856 ^a	100	None	—	Carrier	Died 5/30/51	—
		(years)							
2	10/22/36	1	926 ^a	100	None	—	Carrier	Killed	—
	10/22/36	1	927 ^a	100	None	—	Carrier	Killed	—
3	12/4/37	2-1/6	1062	50	12/25/37	19	Chronic	Died 3/15/38	82
4	10/26/38	5	1045	40	11/10/38	15	Acute	Died 1/26/39	77
5	6/21/39	3-2/3	1102	30	7/14/39	23	Acute	Died 8/11/39	27
6	10/21/40	5	1215	50	11/14/40	25	Subacute	Died 12/9/40	25
7	2/24/41	5-1/3	1287	100	3/17/41	21	Subacute	Died 4/21/41	35
8	4/1/41	5-1/2	1169	25	5/10/41	39	Chronic	Killed	—
	4/1/41	5-1/2	1238	25	5/5/41	34	Acute	Died 5/22/41	17
	4/1/41	5-1/2	1195	25	4/30/41	29	Acute	Died 5/27/41	27
	4/1/41	5-1/2	956	25	4/30/41	29	Acute	Killed	—
	4/1/41	5-1/2	1242 ^a	25	None	—	Carrier	Killed	—
	4/1/41	5-1/2	972	25	4/22/41	21	Subacute	Killed	—
	4/1/41	5-1/2	1149	25	5/5/41	34	Subacute	Killed	—
	4/1/41	5-1/2	1207	25	4/26/41	25	Chronic	Killed	—
9	8/2/46	10-5/6	1598	200	8/12/46	10	Subacute	Killed	—
10	2/24/48	12-1/5	1584	100	4/1/48	37	Chronic	Killed	—
11	4/28/50	14-1/2	1422	100	5/16/50	18	Chronic	Killed	—
12	6/5/51	15-2/3	1486	60	6/22/51	17	Chronic ^a	Killed	—
13	5/20/52	16-1/2	1489	100	4/22/52	32	Acute	Died 5/4/52	12
14	4/6/54	18-1/2	1532	100	None	7	Subclinical ^b	Alive	—

^aCarriers, when reinjected with same strain of virus, usually showed little or no reaction. ^bBlood from horse 1486, when injected on Aug. 28, 1951, into normal horse 1415, produced symptoms of infectious anemia in twenty days. ^cWhen 100 cc. of blood from horse 1532 was injected on June 24, 1954, into normal horse 1536, it produced symptoms of acute infectious anemia in twenty-six days. ¹The incubation period in the test horses varied from nine to thirty-nine days. ²Sixteen of 28 normal test horses developed the disease in an acute fatal form; 5 carriers failed to react.

tive carriers, many of them develop the disease in an acute or subacute form.

During studies and surveys of the disease among mules in the Mississippi delta from 1930 to 1936, U.S.D.A. investigators obtained evidence that inapparent carriers existed in this area during that period.

TABLE 3—Summarized Data on Proved Virus Carriers of Short Duration

Carrier horse (No.)	Date infected	Strain of virus	Date of last positive horse inoculation test for virulence	Approx. time† remained a carrier (months)
887	9/30/35	Miss.	3/6/36	5
1128	1/21/46	Calif.	8/2/46	6
711	3/6/36	Miss.	11/18/36	8
880	7/31/35	Miss.	4/10/36	8
1524	9/12/41	Calif.	5/15/42	8
893	9/11/35	N. Y.	6/4/36	9
1461	4/28/50	N. H.	4/6/51	11
1053	7/11/38	Md.	7/27/39	12
1017	6/14/37	Md.	7/11/38	13
1451	8/12/49	Wyo.	10/20/50	14
1401	8/25/47	N. H.	4/15/49	20
999	3/20/37	N. Y.	7/27/39	28
1410*	8/25/47	N. H.	8/28/51	48

*See plate 1, D. †This is approximate time after original infection that animal remained a carrier.

Ishii¹⁵ in a recent article reported that in certain areas in Japan where the disease is enzootic and difficult to diagnose it occurs mostly in a mild form with only slight symptoms, and constitutes one of the most serious infectious diseases of horses in that country.

It is generally believed that a subclinical form of the disease may develop in animals with a high degree of natural resistance or when fully susceptible animals are exposed to a modified virus or virus in a highly diluted form.

Miura, Kutii, and Ueda¹⁶ have shown that an inapparent or latent form of the disease can be induced in susceptible horses by injection of virus highly attenuated by the action of 5 per cent phenol at 37 C.

During our studies on different aspects of the disease under experimental conditions, we have encountered only a few cases of subclinically induced infection.

Four cases of subclinical infection were induced as follows: horse 1300, by the bites of infected mosquitoes; horse 1277, by subcutaneous inoculation of 1 cc. of 1:100,000 dilution of virulent serum; horse 1170, by subinoculation of blood from subclinical case 1300 mentioned above; and horse 1532, by injection of blood from an 18½-year-old carrier (case 884). All of these inapparent cases proved to be carriers by subinoculation of their blood into susceptible horses. Horses 1300 and 1277 were again resistant when injected subcutaneously three months later with large amounts of virus, indicating they were in a state of premunition (inapparent carriers). These cases were described in a previous report.¹⁷ On the other hand, subclinical cases 1170 and 1532 reacted when re-exposed to known virus. However, although not definitely determined, it is believed that the reaction produced in these horses represented a recrudescence of the latent infection rather than a reinfection (table 4 and fig. 2).

RECOVERED CARRIERS

During our studies on carriers, we encountered 3 experimentally induced carriers in which evidence was obtained that their

TABLE 4—Transmission Experiments with Subclinical Cases of Equine Infectious Anemia

Principal test horse	First exposure test			Test for virus in blood of principal horse		Challenge of principal horse		
	Material	Date	Results	Date	Horse	Date	Virus	Results
1277*	1 cc. of 1:100,000 dilution of virulent serum. (Wyo. virus.)	7/3/41	No reaction in 40 days	11/18/41	1288	10/9/41	Wyo.	No reaction in 102 days**
1300	186 bites with infected mosquitoes (Wyo. virus)	7/15/41	No reaction in 85 days	11/18/41	1170	10/9/41	Wyo.	No reaction in 102 days**
1170	300 cc. whole blood from subclinical case 1300 (Wyo. virus)	11/18/41	No reaction in 61 days	11/13/42	1331 (fig. 1)	5/15/42	Wyo.	Reaction in 9 days acute case†
1532*	100 cc. whole blood from an 18½ year carrier, 884 (N. Y. virus)	4/6/54	No reaction in 79 days	6/24/54	1536	6/24/54	N.H.	Reaction in 19 days subacute case†

*Blood collected prior to first exposure was negative for virus on horse-inoculation test. **Failure to react when challenged indicates animal is in a state of premunition and is an inapparent carrier. †The reaction in subclinical cases 1170 and 1532 is believed to represent a reactivation of the latent infection and not a reinfection.

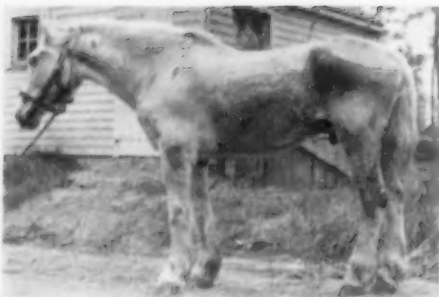


Fig. 2—Horse 1331 with a subacute case of infectious anemia. Its symptoms were depression, muscular weakness, wobbly gait, loss of weight, progressive anemia (r.b.c., 3.5 million; r.c. volume, 0.20). This horse was infected by subinoculation of blood from horse 1300 which had subclinical infectious anemia.

blood, collected six to seven years following the date of original infection, had lost its power to produce the disease in susceptible horses. Such cases were designated as recovered carriers and are referred to as such in this report.

History of Recovered Carrier 1295.—Horse 1295, a normal, 1,050-lb., 12-year-old gelding, was experimentally infected on July 17, 1941, by exposure to the bites of infected horseflies (*Tabanus sulcifrons*) during insect-transmission studies carried out by U.S.D.A. investigators in 1941.¹⁰ The first signs of infectious anemia appeared eleven days later. The initial febrile reaction was mild but was followed by several severe intermittent reactions. Except for sluggishness, partial inappetence, and muscle stiffness, the clinical symptoms were not marked. This horse developed into a mild chronic carrier but febrile attacks continued irregularly until June, 1947. From October, 1941, to March, 1943, the blood was proved to be continuously infectious by subinoculation into 27 susceptible horses. While held under observation, from March, 1943, to June, 1947, he remained in good condition and showed no signs of the disease aside from an occasional febrile attack (fig. 1, G).

However, during the spring of 1949, when approximately 20 years old, he began to show early indications of senility. There was a gradual loss of flesh, posture, and activity. During January, 1951, the general physical condition became progressively worse and he became so weak that he could maintain a standing position only with difficulty (fig. 1, H). On Feb 15, 1951, he became moribund and was destroyed. No characteristic lesions or pathological alterations of equine infectious anemia were found on postmortem or on histopathological examination.

Following the last positive test on the blood of horse 1295 in March, 1943, no further tests were

made until 1948 when 4 susceptible horses were injected with his blood on the following dates: June 16, July 16, August 18, and September 24, respectively. None of the 4 test horses developed clinical signs of infectious anemia but, when exposed to a known virus, they promptly developed the disease, indicating that the blood of horse 1295 was no longer virulent.

Horse 1295 was re-exposed to known virulent virus on Jan. 4, 1949, and again on Aug. 11, 1949, but showed no reactions. Fifty days following the second re-exposure, 1,000 cc. of his blood was injected intravenously into a normal horse (No. 1455) and after an incubation period of thirty-two days produced a mild reaction in the test horse. This would seem to indicate that reinfection in a subclinical form had been induced in horse 1295 by re-exposure. However, when 50 cc. of blood from horse 1295 was injected subcutaneously into a susceptible horse on Aug. 18, 1950, no reaction occurred.

In this connection, in neutralization studies carried out in 1948 and 1949 with serum from carrier 1295 by BAI investigators,¹⁹ it was demonstrated that the neutralization of the virus of infectious anemia occurred when the serum from horse 1295 was mixed with the virus in *in vitro* tests but not in *in vivo* tests.

History of Recovered Carrier 1353.—This animal was foaled March 30, 1942, from a normal mare (No. 1112) in an isolated breeding unit at the Animal Disease Station, Beltsville, Md.

On May 15, 1942, colt 1353 with its dam was moved to the infectious anemia experimental unit where the dam was injected with 30 cc. of infectious anemia virus (Calif. strain). Nine days following exposure, mare 1112 developed acute symptoms of infectious anemia. Although it was definitely determined by horse inoculation tests that her milk contained the virus, colt 1353 which had sucked

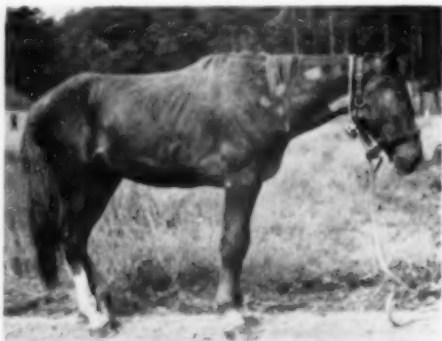


Fig. 3—Horse 1379 which had an acute case of infectious anemia induced by injection of blood collected on July 29, 1942, from carrier 1295, one year after the latter was originally infected.

and been in intimate contact with her for four and one-half months failed to develop symptoms of the disease. Furthermore, when blood of the nursing colt, collected on the seventy-second day after its dam's first reaction, was injected into normal horse 1316, no reaction occurred, indicating that the colt had failed to acquire the infection.

However, when the colt and normal horse 1316 were injected with blood from infected dam 1112 on Oct. 13, 1942, both developed clinical symptoms of infectious anemia after a short incubation period.²⁰ Following the first febrile attack which lasted four days, with a maximum temperature reading of 105.6 F., the colt made an apparent recovery. Aside from numerous mild temperature reactions, the colt developed into an apparently normal horse, was castrated in December, 1946, and remained in excellent condition (fig. 4) up to the time of the last observation by the authors (May, 1953).

Although colt 1353 was first infected on Oct. 13, 1942, his blood was not tested for the presence of virus until April 24, 1946. On that date, a blood sample, when injected subcutaneously into horse 1128, produced clinical symptoms of infectious anemia in twenty-two days, establishing the fact that 1353 was definitely a carrier. No further tests were made until Sept. 24, 1948, at which time 100 cc. of his blood was injected into susceptible mule 1434 with negative results, indicating that 1353 was no longer a carrier. Horse 1353 was then re-exposed to three different strains of virus by subcutaneous injection: on Oct. 5, 1948, with 50 cc. of virulent blood (New Hampshire strain 1251); on Jan. 4, 1949, with 50 cc. of virulent blood (Wyoming strain 1394); and on Aug. 11, 1949, with 50 cc. of virulent blood (New York strain 1420). He did not react to any of these exposures.

On Jan. 4, 1949, 50 cc. of blood from horse 1353 collected before he was exposed to Wyoming virus was injected into normal horse 1121, which failed to show any reaction for ninety days. When test mule 1434 and test horse 1121 were subsequently challenged with a known strain of virus, both promptly developed clinical symptoms of infectious anemia.

On Aug. 18, 1950, following the re-exposure of horse 1353 to the three different viruses mentioned above, his blood was again tested for the presence of virus by subcutaneous injection (50 cc.) into susceptible horse 1380 which failed to develop symptoms of the disease in sixty days. However, when horse 1380 was challenged with a known strain of virus, it developed symptoms of infectious anemia in eleven days. Blood serum from 1353 failed to neutralize the Wyoming strain of virus in *in vitro* neutralization experiments conducted by BAI workers in 1948 and 1949.¹⁹

The results of this experiment indicate that horse 1353, infected on Oct. 13, 1942, when about 7 months old, was still a carrier



Fig. 4—Recovered carrier 1353, in excellent condition, approximately eight years after date of original infection. His blood was no longer infectious, but he resisted reinfection when challenged with three strains of virus.

on April 24, 1946; but when blood was again tested for virus on Sept. 24, 1948, approximately six years following the original date of infection, it was no longer virulent. On the other hand, he was resistant to reinfection when exposed with three different strains of virus. A test made on his blood on Aug. 18, 1950, following the negative re-exposure tests to three different strains of virus, was likewise negative for the presence of the virus. A second neutralization test carried out on May 22, 1952, with serum from horse 1353, which was believed to be no longer a carrier, failed to neutralize the New York, Wyoming, or New Hampshire strains of virus in dilution ratio of 1:39 *in vitro*. However, when 200 cc. of blood serum from horse 1353 was injected subcutaneously, on May 22, 1953, into normal horse 1510, it produced symptoms of infectious anemia after an incubation period of thirty-nine days. Thus, the blood from horse 1353 which had lost its power to infect, as demonstrated by three negative horse-inoculation tests, had again acquired the power to infect when used in large doses of at least 200 cc.

History of Recovered Carrier 1366.—This stallion was foaled Oct. 13, 1942, from mare 1070 which was infected with the New York strain of virus. A sample of blood, collected from foal 1366 immediately after it was born and before it was allowed to nurse its infected dam, was tested for infectivity by injecting it subcutaneously into normal mule 1365. The mule developed a subclinical case of infectious anemia and died on the forty-seventh day following exposure. Postmortem examination showed well-marked lesions of infectious anemia, and histological examination of the tissues revealed pathological alterations character-



Fig. 5—Colt 1366, infected at birth, and its infected dam, horse 1070. Both animals were carriers. This picture was taken about nine months after the birth of the colt.

istic of the disease, indicating that the foal was infected at birth.

When 34 days old, foal 1366 developed an acute febrile attack that lasted for nine days, with a maximum temperature of 105.4 F., then recovered and developed into an apparently normal animal (fig. 5). Aside from one febrile attack in May, 1944, with a maximum temperature of 103 F., the temperature curve from Oct. 25, 1942, to July 16, 1948, never exceeded one degree above the average normal range. During this entire period, his general physical condition was excellent.

A blood sample from carrier 1366 collected on Sept. 3, 1943, when injected into susceptible horse 1376, produced a subclinical infection. A second blood sample collected on March 28, 1944, when injected into horse 1377, produced a subacute infection in seventeen days. After collection of the latter blood sample, horse 1366 was re-exposed by injection of the New York strain of virus, with no reaction occurring in 105 days, which was additional evidence that he was a carrier on this date.

His next virus test was July 16, 1948, when 100 cc. of his blood was injected into susceptible horse 1394. No reaction occurred in sixty days, but when this animal was challenged with known virus it promptly developed infectious anemia.

Horse 1366 on July 17, 1948, was again re-exposed by injection of Kentucky strain of virus 1406 and developed symptoms of infectious anemia in ten days.

The results of this experiment indicate that horse 1366, which was infected at birth on Oct. 13, 1942, by intrauterine transmission and which was demonstrated to be a carrier on March 28, 1944, was no longer a carrier on July 16, 1948, approximately five and three-fourths years after being infected but, when then challenged with known virus, he again acquired the disease.

SUMMARY

Data are reported indicating that horses making an apparent recovery after being experimentally infected with equine infectious anemia may remain carriers of the virus for five months to more than eighteen years.

The histories of 2 virus carriers that harbored the virus in their blood stream for approximately fifteen and nine-tenths years and eighteen and one-half years, respectively, are reviewed. Also cited are 13 clinically recovered cases which had been experimentally infected with different strains of virus and were demonstrated to be carriers for five to forty-eight months.

Evidence is presented to indicate that: (1) horses with subclinical infectious anemia are inapparent carriers and that the active form of the disease may be transmitted to susceptible horses by injection of their blood in one or two serial passages; (2) in carriers of long standing, there appears to be a gradual decrease in the degree of virulence of the blood; (3) a horse which develops the disease in the carrier form may show no active symptoms for a number of years, and may finally die following an acute flare-up; (4) a small percentage of carriers may make a complete recovery from the disease, with a complete disappearance of virus from the blood stream—of 3 such cases encountered, 2 again became susceptible and 1 was immune; (5) clinically recovered carriers and horses affected with the subclinical form of the disease are usually resistant to reinfection—such animals are in a state of premunition, as attempts to provoke a fresh attack by injection of moderate amounts of the same strain of virus with which they were originally infected usually produce little or no reaction.

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Cholelithiasis in a Cat

FRED J. WIGDERSON, V.M.D.

Hackensack, New Jersey

Cholelithiasis, either in the ducts or gallbladder, apparently is rare in a cat as there is only 1 specific case described in the literature.¹ Riser² discusses icterus in cats and stresses the need for further work on this condition. The following case report is similar to that described by King.¹

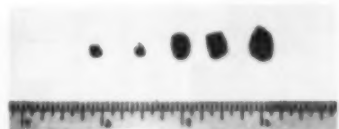


Fig. 1—Stones removed from the gallbladder of a cat (in centimeters).

A 3-year-old castrated male cat had difficulty with urination for about one year. A diagnosis of cystic and urethral calculi was made and the urine flowed freely when the cat was catheterized. Chlorothamine[®] was prescribed and the cat was discharged. It made good progress for about nine months, at which time it was returned with a history of depression for one week, plus emesis and anorexia. The urine flow had been normal.

The temperature was normal but icterus, depression, and dehydration were marked. A diagnosis of jaundice was made and the cat was hospitalized. In spite of treatment, the cat died the next day.

Necropsy showed intense yellow discoloration of all tissues and organs. There were five gallstones, varying in size from 3 to 10 mm., in the common duct. The gallbladder was thickened. The liver showed gross evidence of degeneration.

This case indicates that practitioners should consider gallstones as an etiological factor in feline jaundice.

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Dr. Wigderon is a small animal practitioner in Hackensack, N. J.

Baby kangaroos are only about 1 inch long at birth.—*Sci. News Letter*, Dec. 25, 1954.

Evaluation of Bovine Ketosis Concepts and Therapy (An Abstract*)

Any concept of ketosis must explain the seasonal variation in its incidence. The concept of adrenal insufficiency does not explain the virtual disappearance of the disease in cows on good pastures (chart 1).

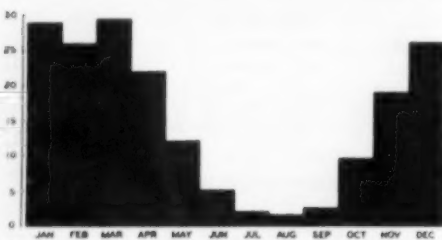


Chart 1—Seasonal distribution of ketosis—a five-year average in a New England practice.

The concept of nutritional insufficiency is compatible with this observation (chart 2).

The endocrine manifestations are believed to follow nutritional deprivation, usually unintentional and are, therefore, considered a consequence rather than the cause of metabolic failure or ketosis. Ketosis has not been produced in cows showing "relative adrenal insufficiency."

Because of its timely interest, this abstract of Dr. Vigue's manuscript is published this month. The complete paper will appear in a future issue of the JOURNAL.

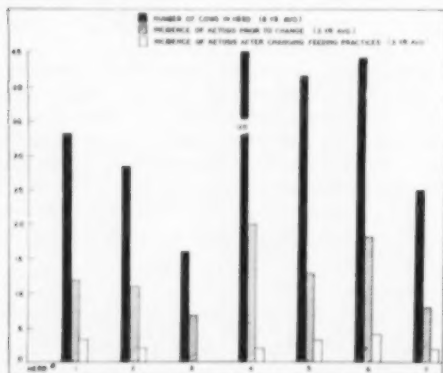


Chart 2—This chart shows how ketosis was reduced in seven New England herds by the sound feeding recommendations of the National Research Council. These results agree with those of Tyznik who reduced the incidence from 40 to 2 per cent in some herds by proper feeding.

The nutritive ratio of the ration is more of a factor in producing fatness of the dairy cow than is the plane of nutrition. Fat cows are not necessarily healthy cows. Obesity predisposes to ketosis. The incidence of ketosis has increased with changes in feeding practices emphasizing higher energy and lower protein allowances for the dry cow.

Ketosis does not develop as a result of a deficiency of nutrients; it is the degree of the deficiency in relation to the stress of heavy lactation that is critical.

The practitioner can diagnose ketosis. The failure of a cow to respond to any particular therapy does not necessarily indicate an error in diagnosis. In stubborn cases the variation in the duration, severity, and extent of the depletion, et cetera must be considered.

No one treatment is effective in all cases of ketosis, yet most treatments appear to be effective in some cases. Since spontaneous remission occurs, caution must be used in evaluating any form of therapy. Affected cows selected at random for treatment with ten separate therapeutic agents, and the results, are shown in table 1 (see opposite page).

The value of ACTH, cortisone, and hydrocortisone in ketosis, as well as in all other systemic diseases, can not be entirely attributed to their metabolic effects. The hormones play a very active role in restoring physiological equilibrium in any disease process. This latter effect may also find application in other metabolic conditions such as parturient paresis, grass tetany, and eclampsia.

The problem in ketosis is to avoid situations of increased "need" for cortical hormones by eliminating all possible conditions which increase "stress." It is assumed that nothing is wrong with the anterior pituitary-adrenal cortex axis. It plays an essential, but not primary or causative, role in the disease.

The use of ACTH, cortisone, and hydrocortisone is a valuable adjunct to our armamentarium against ketosis. However, these agents are not substitutes for alimentations, which is the only means of preventing deprivation states. This writer does not consider these hormones to be "specific" for bovine ketosis.—R. F. Vigue, Springvale, Maine.

TABLE 1—Summary of Results from Treatment of Uncomplicated Ketosis

THERAPY	No. Treated	Method of Administration	No. Recovered	1st Treatment	Required More Than 1 Treatment	Therapy Employed on Retreatment (Where Necessary)										No. Not Benefited	REMARKS
						Glucose		HORMONES						AMINO ACIDS (Drip Method) ^⑤			
						Cows Treated	No. Treat-ments Required	ATCH - Gel 400 i.u.	Average No. Treatments	CORTISONE 1 Gm. i.m.	Average No. Treatments	Ketogestin 1 Gm i.m.	Average No. Treatments				
GLUCOSE 500 cc. 50%	10	I.V.	4	2			1	3	1	5			1	1	ANIMAL NOT BENEFITED SLAUGHTERED—CIRRHOSIS LIVER		
GLYCEROL 500 Gm. B.I.D.	8	ORAL	4			3	2	1	2								
CESSATION OF MILKING	3														NOT VERY SEVERE CASES		
SODIUM PROPIONATE 4 oz. B.I.D.	11	ORAL	7 ^④			3	15							1	ANIMAL NOT BENEFITED MADE SLOW SPONTANEOUS RECOVERY		
USE OF SPECIAL FEEDS	7	ORAL	3 ^②			3	2					1	2				
AMMONIUM LACTATE 4 oz. B.I.D.	8	ORAL	2 ^⑥			4	1										
POTASSIUM CHLORATE 1-1½ oz. B.I.D.	9	ORAL	3 ^③			5	2	1	1								
ATCH - GEL. 600 I.U.	10	I.M.	5			2	25	2	1					1			
CORTISONE ACETATE 1 Gm.	10	I.M.	6									2	3	1	2		
KETOGESTIN - ORAL 5 Gm.	10	ORAL	6 ^④			3	15	1	1								
KETOGESTIN - I.M. 1 Gm.	10	I.M.	3	2	2	4	2										

A = Given daily, 7 to 10 days; B = given daily, 4 to 6 days; C = given daily, 5 to 7 days; D = ACTH or hydrocortisone (cortisol) — trademarked name, Upjohn Co., for hydrocortisone in alcohol; E = given daily, 3 to 5 days; F = placebo injected daily for three days.
 I.V. = Intravenous; i.m. = intramuscular.

Distemper in Dogs. I. Virus-Neutralizing Antibodies in Serum Collected from Healthy Dogs

R. L. OTT, D.V.M.; JOHN R. GORHAM, D.V.M., Ph.D.; JOYCE C. GUTIERREZ, B.S.

Pullman, Washington

DEFINITIVE EVIDENCE elucidating the natural history of the distemper virus in canine populations is lacking. Distemper is considered an epizootic infectious disease primarily affecting young dogs, and spread by contact with clinical and subclinical cases or symptomless carriers. The ratio of clinical to subclinical cases can not be determined by the prevalence of cases, using clinical or pathological findings as a basis. Recently, Baker *et al.*¹ described a test using the chorioallantoic membrane of the chicken embryo as a means of titrating distemper-neutralizing antibodies. The present study is the first of a series reporting results of a study of the host-parasite relationship of distemper in dogs. This report deals with the neutralization *in ovo* of an egg-adapted strain of distemper virus by dog serum collected from healthy urban and rural dogs.

MATERIALS AND METHODS

Virus.—The Haig Onderstepoort (HG) egg-adapted strain was employed in its eighty-sixth to ninetieth chorioallantoic passages for the neutralization tests.

Vaccination.—The vaccinated dogs in this study included individuals receiving formalized tissue vaccines and egg-adapted vaccines. The live and killed preparations of several commercial laboratories were represented.

The killed virus vaccines were administered in three subcutaneous inoculations at two-week intervals and the interim between vaccination and serum-sampling was calculated from the date of the final injection of vaccine. Egg-adapted vaccines were employed as a single subcutaneous dose, the interval before bleeding being calculated from the vaccination date.

In part 2, egg-adapted vaccine was prepared in our laboratory. Infected chorioallantoic membranes from the eighty-sixth passage of the HG virus

were employed. A 10^{-1} dilution in nutrient broth was prepared, antibiotics were added, and a subcutaneous dose of 2 ml. per puppy was used.

Dogs.—The dogs used for this study were individuals submitted to the small animal clinic at Washington State College for routine procedures (minor surgery, bathing, etc.). They were of various breeds and ages, and included both males and females. A careful history was taken in order to exclude dogs having had any illness resembling distemper or in which the immunization status was doubtful. The possibility of contact with other dogs was carefully ascertained. All dogs sampled were subjected to a physical examination and were accepted as being in good health. The 3 dogs used in part 2 were raised in semi-isolation at the experimental dog unit at Washington State College.

Dog Serums.—Venous blood was drawn aseptically in centrifuge tubes and allowed to stand overnight at 5 C. The clot was centrifuged at 2,000 r.p.m. for fifteen minutes. The serum was then separated, frozen promptly, and stored at -20 C. All serums were inactivated at 56 C. for thirty minutes immediately prior to use in the neutralization test.

Neutralization Titrations.—The *in ovo* neutralization procedure has been described in detail elsewhere.¹ Briefly, serial fivefold dilutions of serum were mixed with an equal volume of a suspension of infected chorioallantoic membranes diluted with horse serum. The mixtures were held overnight at 5 C. and then in an ice bath until the inoculations were completed. Groups of five to six embryonating eggs, after an incubation period of seven days, were inoculated with 0.1-ml. quantities. Following further incubation at 37 C. for six days, the eggs were examined. The serum dilution end-points were calculated in the usual manner. Each group of dog serums tested was accompanied by a virus titration performed at the same time. The quantity of virus employed in the serum-virus mixtures varied from 100 to 500 median infective doses (i.d.₅₀) per inoculum except in part 2. In this trial, the virus titer was held to a narrower range of 200 to 400 i.d.₅₀. The serums to be compared in all instances were examined in a single test.

RESULTS AND DISCUSSION

Part 1.—In presenting the results of this survey, such grouping of samples as seemed reasonable was used. A limited survey of the neutralizing capacity of serum col-

From the Department of Clinical Medicine and Surgery, College of Veterinary Medicine, State College of Washington (Ott) and the Agricultural Research Service, U. S. Department of Agriculture in cooperation with the Washington Agricultural Experiment Stations (Gorham and Gutierrez), Pullman, Wash.

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lected from vaccinated and unvaccinated dogs is summarized in table 1.

The number of serum samples involved in each group was too small for a reliable analysis, but certain trends were observed. The breed and sex of the dog, seeming to have no bearing on the circulating antibodies in the serum, were not included. Contrary to expectation, the tabulated data show that there was no evident correlation between the age of the individual and the neutralizing titer of the serum in either the vaccinated or the unvaccinated group. Two factors which did appear to affect the level of circulating neutralizing antibodies were (a) vaccination and (b) environment, particularly contact with other dogs. The effect that environment has on the production and maintenance of neutralizing antibodies is discussed in part 3.

As anticipated, the mean titers of the vaccinated groups were usually greater than those of the corresponding unvaccinated groups. Under the conditions of this survey, it appears that the neutralizing antibody titer may be directly proportional to the interval of time between vaccination and sampling. Dogs vaccinated less than one month before sampling showed a relatively low titer; the majority in this group, however, had been vaccinated only two weeks prior to sampling. The group that had been vaccinated for more than one month, but less than 2 months, prior to sampling exhibited the highest titer, while those vaccinated three months prior showed high titers, but less than the previous group. When five to ten months had intervened between vaccination and bleeding, the titer was considerably reduced. One dog in the latter group showed

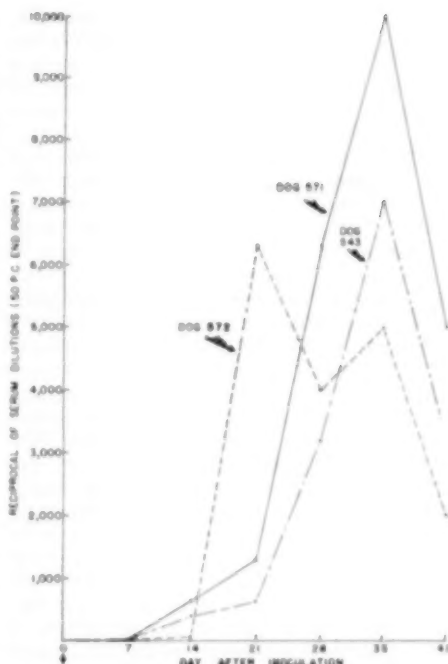


Chart 1—Neutralizing antibody titer curves of serum from 3 dogs following vaccination with egg-adapted distemper virus.

no neutralizing antibodies in the serum, suggesting the possibility of a vaccination failure in this animal.

Part 2.—In order to study the antibody response evoked by a vaccine and to compare that response to the field studies presented in table 1, 3 puppies, 10 weeks of age, were vaccinated with HG virus. Chart 1 illustrates the rise and subsequent

TABLE 1—Results of Canine Distemper Virus-Neutralization Tests of Serum Obtained from Unvaccinated and Vaccinated* Dogs

Total No. of dogs	Age	Vaccination status	Range of neutralization titers†	Mean titer†
7	Less than 6 mo.	Unvaccinated	0 - 250	37
3	6 mo. - 1 yr.	Unvaccinated	5 - 320	214
4	1 - 2 yr.	Unvaccinated	5 - 20	9
9	2 - 5 yr.	Unvaccinated	6 - 5,010	1,265
7	More than 5 yr.	Unvaccinated	0 - 250	53
4	Less than 6 mo.	Vaccinated more than 1 mo., but less than 2	100 - 10,000	5,778
		Vaccinated less than 1 mo.	0 - 650	318
10	6 mo. - 1 yr.	Vaccinated 3 mo.	2,000 - 5,000	3,000
		Vaccinated more than 3 mo.	0 - 3,200	825
9	1 - 2 yr.	Vaccinated more than 10 mo.	0 - 2,600	597
7	2 - 5 yr.	Vaccinated 20 mo. to 4 yr.	10 - 2,500	765
4	More than 5 yr.	Vaccinated more than 5 yr.	0 - 1,250	452

*Commercial vaccine used. Three doses tissue vaccine at fourteen-day intervals or one dose egg-adapted modified live virus.

†Numbers expressed as the reciprocal of the serum dilution (50% end-point).

decline of the estimated serum-neutralizing antibodies. The levels attained are similar to those observed in the vaccinated groups in table 1, in that the titer attained its highest level at approximately one month postvaccination and thereafter declined.

Part 3.—Table 2 records the effect of environment (as pertaining to contact with other dogs) on the production and maintenance of distemper-neutralizing antibodies. In this study, only dogs vaccinated more than one year were included because, in dogs vaccinated less than one year, the immediate postvaccination rise in titer probably would have dominated the environmental effect.

The majority of unvaccinated urban dogs more than 6 months of age showed a considerably higher neutralizing antibody titer than did the rural dogs in the same age group. It is noteworthy that these unvaccinated urban dogs showed greater neutralizing antibody levels than did the rural dogs that had been vaccinated for more than one year. It is evident then, on the basis of the above observations, that contact was responsible for the production of distemper-neutralizing antibodies, with mild or subclinical infection being an important factor in the epizootiology of the malady.

Distemper in dogs may be similar to poliomyelitis in man in that the serum of many normal adults with no history of the disease neutralizes the virus, and that these adults are less susceptible to the disease. The findings reported herein would seem to indicate that many unvaccinated urban dogs have, at some time or other, had a symptomless or mild attack of distemper which has stimulated the production of antibodies. However, even among dogs classified as urban, there are varying degrees of actual contact as determined by the degree of confinement and the relative

density of the canine population. The influence of nutrition and other factors on the resultant titers must also be considered. These effects are indicated by the considerable range in titers shown in table 2. Where contact with the infection is not afforded, antibodies at high levels are not found in the serum. If the disease is introduced in an isolated population of dogs not previously exposed to infection, the consequences might be disastrous, as was illustrated in an outbreak of distemper at Point Barrow, Alaska, where a high proportion of dogs of all ages were attacked and the majority of cases proved fatal.²

A striking feature of the neutralization studies of serums collected from dogs late in the course of frank, often fatal, distemper is the extremely low level of neutralizing antibodies.³ Further study is required to elucidate the relationship between the viremia and the suppression of neutralizing antibody.

The number of vaccinated dogs that are designated as rural in table 2 is too small to be conclusive, but finding rural dogs that have been vaccinated is difficult. Regardless of the small number of dogs in this group, it would appear that repeated exposure is necessary to maintain a relatively high neutralizing antibody titer. Whether exposure to the virus at a time when the postvaccinal titer was significantly reduced would merely bring about a marked rise in titer or whether such exposure would produce frank clinical distemper are questions which must, for the present, remain unanswered. Although studies are underway, no direct correlation has been made at this time between the amount of neutralizing antibody present in the serum of a patient and the resistance of that patient to challenge with a virulent distemper virus.

As a part of the present investigation

TABLE 2.—The Effect of Environment on the Production and Maintenance of Distemper-Neutralizing Antibodies in Dog Serum

Total No. of dogs	Age	Vaccination status	Environment*		Range of neutrali- zation titers†	Mean titer‡
			Rural	Urban		
7	Less than 6 mo.	Unvaccinated	X#	—	0 - 250	37
13	More than 6 mo.	Unvaccinated	X	—	0 - 630	104
10	More than 6 mo.	Unvaccinated	—	X	5 - 5,010	1,232
4	More than 18 mo.	Vaccinated more than one year	X	—	0 - 790	257
14	More than 18 mo.	Vaccinated more than one year	—	X	0 - 2,500	710

*The environment has been considered as rural if the patient had only very occasional contact with other dogs. †Number expressed as the reciprocal of serum dilution (50% end-point). ‡The dogs in this group were 3 months or less of age and had no contact with other dogs after weaning. The environment could thus be considered as rural.

of distemper in dogs, neutralization antibody estimates have been secured from the serums of several dogs inoculated with live and killed distemper virus vaccines.⁴ In general, the antibody response curves are similar to those of the 3 dogs in chart 1.

It is conceivable that serological differences exist between strains of distemper virus and that the test strain used (Haig Onderstepoort egg-adapted) reacted to a greater or lesser extent with antibody stimulated in different dogs by antigenically distinct virus strains.

SUMMARY

1) The presence of distemper-neutralizing antibodies in the serum of vaccinated and unvaccinated healthy dogs of various breeds, sex, and ages under different conditions of environment has been determined.

2) It was found that the breed, sex, and age of the dog does not appear to influence the level of neutralizing antibodies.

3) The period of time after vaccination and the environment of the individual with regard to contact with other dogs had a marked effect on the production and maintenance of neutralizing antibodies. Dogs subject to the exposures of an urban environment had serum titers at higher levels than dogs raised in the country.

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More on Phenothiazine for Horses

A brief abstract, suggesting that yearling colts were less playful when given phenothiazine in their feed for three weeks of each month, appeared in the *JOURNAL* (Jan., 1955: 46). At the request of Dr. W. H. Wright, Elmont, N. Y., the following information regarding this possibility has been furnished by Dr. A. C. Todd, parasitologist at the University of Wisconsin.

A performance analysis of racing results, comparing horses born from 1941 to 1945 which did not receive phenothiazine with

the 1947 to 1950 colt crops which received phenothiazine in their feed, indicates a superior average performance by the treated group. The average index of performance as 2-year-olds was 1.151 for the treated versus 1.097 for the untreated; as 3-year-olds, it was 1.936 versus 1.899 for the untreated; and as 4-year-olds, it was 2.382 versus 1.695 for the untreated horses. Thus "low-level phenothiazine therapy has at least not adversely affected the performance of such Thoroughbreds."

After using phenothiazine this way, post-mortem and blood examinations failed to show any gross or microscopic pathological changes, even though some of the horses had received as much as 4 Gm. daily for several months.

Furthermore, there were significant reductions in the number of strongyle larvae lodged in the anterior mesenteric artery in the treated horses.

Reactions from Hog Cholera Vaccine

When, in 1953 in France, 52 experimental pigs were vaccinated with a lapinized virus vaccine alone, febrile reactions occurred from the second to fifth days but no symptoms were observed. When this vaccine was used on 8,000 pigs under field conditions, 7.2 per cent had a violent thermal reaction and 1.12 per cent died. A solid immunity was obtained in all survivors.—*Vet. Bull.*, Jan., 1955.

Children Tested for Mycoses

The school children of two Texas counties were tested with histoplasmin, coccidioidin, and tuberculin intradermally injected, separately but simultaneously. Histoplasmin sensitivity increased with age, reaching 40 per cent at 18 years. Coccidioidin reactions occurred in less than 4 per cent, the main endemic area being farther west.—*Pub. Health Rep.*, Jan., 1955.

Ulcerative Stomatitis in Cats.—That the preoperative use of quaternary ammonia compounds on the skin of a cat may be responsible for the development of ulcerative stomatitis when the cat later licks the area was suggested recently. When used, these products should not be left on the skin in concentration.—*G. G. Freier, D.V.M., Michigan.*

Antibiotic-Resistant Micrococci in Subclinical Mastitis

JOHN A. ALFORD, Ph.D.; HELJO LUSI, M.S.; H. F. McCrORY, D.V.M.

State College, Mississippi

DURING THE past few years there has been a definite increase in the number of antibiotic-resistant micrococci (*Micrococcus pyogenes* var. *aureus* and *M. pyogenes* var. *albus*) encountered in hospitalized human patients.¹⁻⁴ With the increased use of antibiotics in the treatment of mastitis, the possibility of an antibiotic-resistant bacterial flora developing in the udder is one of real concern to the veterinarian. In addition, the development of a reservoir of bacteria that also are human pathogens would have serious public health implications. Some workers⁵ have isolated micrococci from cases of mastitis that are undergoing antibiotic therapy and from this have concluded that the bacteria were resistant to the antibiotic. Some of the advertisements of mastitis treatments imply that the antibiotic-resistant bacterium is of most concern in treating these infections.

Schalm and his co-workers^{6,7} studied penicillin-resistance of *M. pyogenes* as a part of their extensive studies on mastitis. They found in one herd that only 4 per cent of the cultures were resistant to 1 unit of penicillin per milliliter of broth even though the herd had undergone extensive penicillin therapy for several years. In another herd, in which treatment was limited to clinical mastitis, 56 per cent of the *M. pyogenes* strains isolated were resistant to 1 unit per milliliter and 18 per cent to 10 units per milliliter. Heishman⁸ found only one penicillin-resistant *Micrococcus* out of 53 isolated from cases of mastitis. Ford and Wilson⁹ found no resistant strains of *Streptococcus agalactiae* among cultures isolated from penicillin-treated udders.

This investigation was undertaken to gain further knowledge on the resistance of micrococci isolated from different dairy herds and to include antibiotics other than penicillin.

From the Department of Animal Diseases, Mississippi Agricultural Experiment Station, State College. Published with the approval of the director as journal article No. 463. Miss Lusi is now associated with the Bacteriology Department, Pfizer Therapeutic Institute, Maywood, N.J.

MATERIALS AND METHODS

Individual quarter samples were obtained from animals in four herds. Approximately 1,800 samples from 350 cows were examined. Clinical mastitis in these animals had been treated with penicillin, a penicillin-streptomycin combination, and occasionally with other antibiotics. The samples were incubated twenty-four hours at 37 C. and then streaked on Chapman-Stone medium.¹⁰ A representative colony was picked from each sample growing on the Chapman-Stone medium and its ability to produce coagulase determined by the procedure described by Chapman *et al.*¹¹ The sensitivity of the isolates to penicillin, aureomycin[®] (chlortetracycline), and dihydrostreptomycin was determined by the base-seed agar technique and Difco-sensitivity disks.¹²

RESULTS

Over 1,000 colonies of micrococci were isolated from the Chapman-Stone plates and approximately one half of them were coagulase positive. The sensitivities of 310 of these coagulase-positive micrococci to penicillin, aureomycin, and dihydrostreptomycin are given in table 1. Of these strains, 98

TABLE 1.—Sensitivity to Antibiotics of Coagulase-Positive Micrococci Isolated from Subclinical Mastitis

Antibiotic	Sensitive*	Moderately sensitive†	Resistant‡
Penicillin	304 (98.1%)	5 (1.6%)	1 (0.3%)
Aureomycin	304 (98.1%)	3 (0.9%)	3 (0.9%)
Dihydro-streptomycin	20 (6.5%)	289 (93.0%)	1 (0.3%)

*Definite zone of inhibition around disk containing 0.5 unit of penicillin, 10.0 µg. of aureomycin, or 1.0 µg. of dihydrostreptomycin. †Same as above except disks contained 1.0 unit, 30.0 µg., and 10.0 µg., respectively. ‡Slight or no zone of inhibition around disks containing 10.0 units, 60.0 µg., and 100 µg., respectively.

per cent were sensitive to penicillin and aureomycin and 93 per cent of them were moderately sensitive to dihydrostreptomycin. From all of the cultures studied, only five showed any considerable degree of resistance and these were sensitive to one or more of the other antibiotics.

In order to determine if the resistance of bacteria in a treated udder might be in-

[®]Aureomycin is the trademarked product of Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.

creased to any extent for a few weeks after treatment, 9 cows were selected that were shown to be shedders of coagulase-positive micrococci in one or more quarters. The infected quarters were treated on four successive days with 100,000 units of penicillin and samples were taken at weekly intervals to determine the effectiveness of the treatment. The results of this treatment are shown in table 2. It is apparent from these

TABLE 2—Effect of Penicillin on the Persistence of Coagulase-Positive Micrococci in Infected Udders and on the Antibiotic Sensitivity of Isolates from the Treated Udder

Cow No.	No. infected quarters before treatment ^a	No. treated quarters infected after		
		1 wk.	2 wk.	3 wk.
1	4	2	4	3
2	5	1	2	2
3, 4	2	1	2	2
5	2	2	1	1
6	2	0	0	1
7, 8	2	1	1	1
9	1	1	1	1

Note: All of the micrococci isolated before and after treatment were inhibited by 0.5 unit of penicillin.

^aTreated with 100,000 units of penicillin per quarter on four successive days.

data that the failure to clear up the infection was not due to the presence of a resistant bacterium. Schalm and Ormsbee⁶ have shown that intensive and continued treatment coupled with segregation and culling are necessary to reduce the incidence of *Micrococcus mastitis* to a low level in a herd.

DISCUSSION

Schalm and Ormsbee⁶ have proposed the hypothesis that *Micrococcus pyogenes* proceeds from a free-living stage in the milk channels through two stages of tissue invasion and that failure of some udders to respond is due to localization of organisms in the tissue. The extensive investigations by Schalm and Woods^{7,13} bear out this theory both in regard to shedding characteristics of *Micrococcus*-infected herds and in relation to treatment failures. In cases of chronic mastitis that do not respond to treatment, it seems reasonable to assume that the micrococci are so embedded in the tissue that some of them are not reached by the routine treatments. In such cases, an improved vehicle to carry the antibiotic into the tissues or to increase its absorption would be of more value than a change in

therapeutic agent. Welch⁴ has summarized most of the literature on resistant micrococci in man, and he states that, "the increase in antibiotic-resistant staphylococci has been magnified and overemphasized by the results observed in studies of hospitalized infections." Our data and those of others indicate a similar overemphasis on the importance of antibiotic resistance in dairy herds. Resistant strains occasionally are encountered, but antibiotic-resistant micrococci probably cause only a small percentage of the cases of mastitis that do not respond to treatment.

CONCLUSION

It is concluded that the development of strains of micrococci resistant to antibiotics accounts for only a small percentage of the cases of mastitis that fail to respond to antibiotic therapy.

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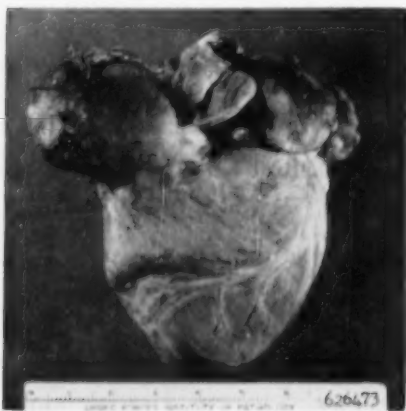
Malignant Hemangio-Endothelioma of the Canine Heart

LEO L. LIEBERMAN, D.V.M.

Waterford, Connecticut

Tumors of the hearts of dogs are not frequently reported. A malignancy that apparently has its origin in the heart is rare.

A spayed female Beagle, 7 years old, was presented on Nov. 27, 1953, with a history of "not being as active as usual." The temperature was normal and the appearance of the animal was languid. The owner re-



—Armed Forces Institute of Pathology
Fig. 1—The hemangio-endothelioma shown projecting from the wall of the right atrium of the dog's heart.

ported that the dog had retched and vomited frequently during the previous few days. It was given 10 cc. of 50 per cent glucose solution and 50 mg. of pyridoxine intravenously, and the owner reported improvement the following day.

On November 30, the owner reported the dog had been doing well when it suddenly collapsed and died.

At autopsy, all the membranes were white. The liver was enlarged. The lungs and spleen were spotted with dark red to

black areas measuring 2 to 12 mm. in diameter. The pericardium was greatly distended with blood. An oval-shaped nodule measuring 3.5 by 2.5 by 2.0 cm. projected from the wall of the right atrium and was attached by a sessile base (fig. 1). No communication with the right atrium was observed.

MICROSCOPIC EXAMINATION

A report of the microscopic examination of the tissues submitted to the Armed Forces Institute of Pathology (Accession No. 626473) follows:

Heart.—A thin wall of the right atrium covers a large mass of blood and fibrin. Large irregular-shaped cells with oval nuclei containing several nucleoli surround this blood clot and also form vascular channels. Excessive nuclear pleomorphism is observed. The myocardium contains focal infiltrations of lymphoid-type cells in areas of muscle necrosis. Hemorrhage into the intramuscular connective tissue is also observed. The epicardium is thickened considerably and many of the surface cells contain large vacuoles and a single eosinophilic structure slightly smaller than an erythrocyte.

Lung.—There were a number of small nodules consisting of a central mass of blood resembling that found in the atrium.

Spleen.—A nodule measuring 6 mm. diameter is found on the surface. This nodule consists of tightly packed malpighian corpuscles and is partially covered by the splenic capsule.

Kidney.—The glomeruli contain an increased number of nuclei and the basement membranes of the glomerular tufts are thickened. An occasional focal collection of lymphoid type of cells is found associated with a branch of an arcuate artery.

Liver.—Varying degrees of fatty metamorphosis are observed.

Diagnosis.—The diagnosis is malignant hemangio-endothelioma of the right atrium with metastasis to the lung.

Summary.—A case of malignant hemangio-endothelioma of the heart of a dog is reported. The Registry of Veterinary Pathology has no other record of this type of tumor of the canine heart.

Vaccinating Mink Against Distemper

To protect mink against distemper, the parent stock should be vaccinated before the breeding season and the kits after weaning. To counteract an outbreak, the clinically affected animals should be destroyed and those remaining vaccinated.—*Vet. Bull.*, Jan., 1955.

Dr. Lieberman is a general practitioner in Waterford, Conn.

Coccidioidomycosis in the Dog

Report of Three Clinical Cases*

CHARLES H. BURGER, D.V.M., M.S., and NORMAN E. LEVAN, M.D.

Bakersfield, California

NATURALLY OCCURRING coccidioidomycosis in the dog, except as a postmortem finding,¹⁻⁶ has, we believe, never been previously reported. The purpose of this paper is to present 3 clinical cases of the disease, 2 of which were diagnosed in the living animal.

The cases comprising this report were seen at a veterinary hospital within the enzootic area in 1953 and 1954. The clinical pictures were markedly similar to the manifestations so well known in human medicine.

CASE REPORTS

Cases 1 and 2 concern concurrent infections in 2 young kennel mates born and raised in Taft, Calif. (southern San Joaquin Valley), where they were housed in wooden kennels with adjacent dirt runs. Dog 1 recovered; dog 2 died of disseminated coccidioidomycosis.

Case 1.—On Nov. 28, 1953, a previously healthy 18-month-old female Scottish Terrier was hospitalized with a three-day history of trembling, anorexia, fever, and slight cough. She had been immunized against canine distemper and hepatitis.

On admission, the dog was found to have a respiratory infection and a temperature of 104 F. During the next few days, despite therapy including distemper and hepatitis antiserum, dihydrostreptomycin and penicillin intramuscularly and sulfonamides orally, the cough increased and dyspnea was noticed. No further antibiotics were administered. In the following two weeks on supportive treatment only, although intermittently febrile, the dog improved sufficiently to be discharged. At this time, *Coccidioides immitis* was cultured from

sputum. A chest roentgenogram (fig. 1) on Dec. 15, 1953, showed an area of infiltration overlying the right diaphragm. Adenopathy or bone lesions were not observed. A follow-up chest roentgenogram (fig. 2) taken Feb. 28, 1954, showed complete clearing of the previously described infiltrate of the right lung.

On Oct. 5, 1954, eleven months after the onset of illness, a complement-fixation test for coccidioidomycosis showed a four-plus reaction in dilutions through 1:24. In the meantime, the dog had become and remained asymptomatic.

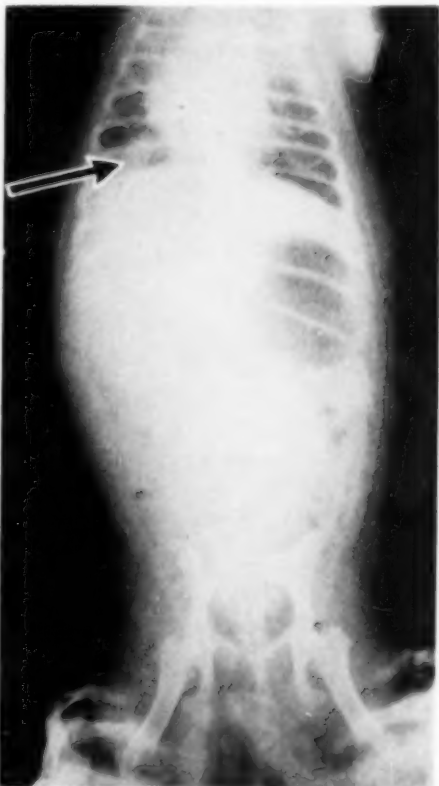


Fig. 1.—Roentgenogram showing infiltrate in right lung of dog (case 1).

From the Bakersfield Veterinary Hospital (Burger) and the Department of Dermatology, University of Southern California, School of Medicine (Levan), Bakersfield, Calif.

The authors are indebted to J. W. Birnner, M.D., radiologist, San Joaquin Hospital, Bakersfield, Calif., for roentgenographic studies; to Jean R. Edgar, D.V.M., Bakersfield, for the opportunity of studying case 3; and to J. Leonard, bacteriologist, Kern General Hospital laboratory, for serological tests.

*These 3 dogs are the subject of another report submitted to a medical (human) journal, with human epidemiological discussion.

Case 2.—On Oct. 23, 1953, a 7-month-old male Scottish Terrier (kennel mate of case 1) was hospitalized, with a history of listlessness and anorexia of a week's duration, and possible anuria during the preceding twenty-four hours. He had been immunized against canine distemper and hepatitis.

Admission findings were a slightly elevated temperature and a distressed appearance. Subsequent to an admission catheterization, the dog was able to void urine normally. His blood count was:

Hemoglobin	12.5 Gm./100 ml.
r.b.c.	5,210,000/cmm.
w.b.c.	25,000/cmm.
Polymorphonuclear leukocytes	62 per cent
Lymphocytes	38 per cent

During the next four days, he received daily intramuscular injections of penicillin, dihydrostreptomycin, and vitamins. Nevertheless, his temperature rose to 104 F.,

there was slight weight loss, and ascites appeared. During the ensuing month, there was continued deterioration in the dog's condition despite administration of aureomycin® orally and sulfonamides intravenously, forced feedings during periods of anorexia, and oxygen terminally.

On necropsy, the body showed moderate wasting. A mucopurulent exudate partially filled both pleural cavities. Throughout the lungs there were firm yellowish white miliary lesions, some of which had coalesced to form masses up to 1 cm. in diameter. A granulomatous mass, 1 by 3 cm., was attached to the diaphragm at the esophageal hiatus, extending into the mediastinum. The mediastinal lymph nodes were involved with an inflammatory and granulomatous process, and there was one such focus in the myocardium. The gastrointestinal tract, liver, spleen, and pancreas were apparently normal. The kidneys and adrenal glands contained a number of miliary nodules. The brain and spinal cord were not examined. *Coccidioides immitis* was identified in fresh smears from pleural cavity lesions. Sabouraud's glucose agar flasks were inoculated from these lesions and good mycelial growth of *C. immitis* was obtained.

Histological examination† of the involved organs showed the essential pathological changes to be focal granulomas composed chiefly of polymorphonuclear leukocytes and epithelioid cells, occasionally with central necrosis. Many of these granulomas contained spherules with double contoured walls, some with the endosporeulation pathognomonic of *C. immitis* (fig. 3).

Case 3.—On Feb. 27, 1954, a previously healthy, distemper-immunized, 1-year-old male Boxer, born and raised in Bakersfield, Calif., was hospitalized because of a two-day illness characterized by dyspnea and anorexia. Admission findings were those of respiratory infection, a temperature of 105 F., and moist râles throughout both lungs.

During the next month, in addition to supportive treatment, the dog received successive courses of the following drugs: sulfonamides, intravenously and orally; penicillin and dihydrostreptomycin, intramuscularly; aureomycin, chloromycetin,® and erythromycin, orally. There was partial

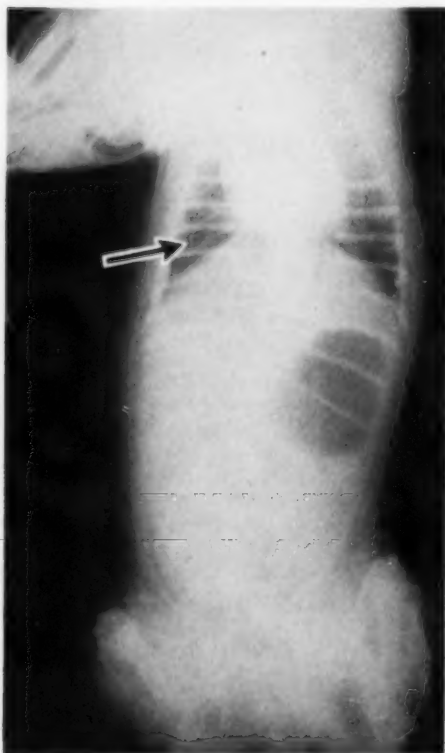


Fig. 2—Roentgenogram showing clearing of previously demonstrated infiltrate in dog (case 1).

†The histological examination was made by J. Moulton, D.V.M., School of Veterinary Medicine, University of California, Davis.

clearing of the lungs, but the dog remained febrile.

In view of the failure of these therapeutic agents, ordinarily effective in canine pneumonias, the possibility of coccidioidomycosis was entertained as early as the end of the first week of treatment. On April 1, 1954, a serological test^{**} for *C. immitis* infection showed:

Complement-fixation tests: serial dilution of serum (0.25 cc.)				
1:2	1:4	1:8	1:16	
++++	++++	++++	++++	
1:32	1:64	Control		
++++	neg.	++++		
Precipitin tests: serial dilutions of antigen				
Undiluted	1:10	1:40	1:100	
	++++	++++	neg.	

^{**}This test was performed at the School of Public Health, University of California, Berkeley, by Charles F. Smith, M.D.

Dr. Smith's comment was, "While specimen was anticomplementary and thus adequate interpretation of the complement-fixation test is not feasible, precipitins offer convincing proof that (the dog) had coccidioidal infection."

The animal was next seen on Sept. 28, 1954, when he was brought in for euthanasia. In the interim, there had been progressive wasting and gradually enlarging, hard, painful swellings on the legs, first noted by the owner in May, 1954.

Before euthanasia, a blood specimen was sent to Kern General Hospital. There was a four-plus reaction to the complement-fixation test for coccidioidal infection in dilutions through 1:16. A chest roentgenogram (fig. 5) showed a small calcific density at the right base measuring approximately 3 mm. in diameter and increased markings paralleling the right cardiac border. There

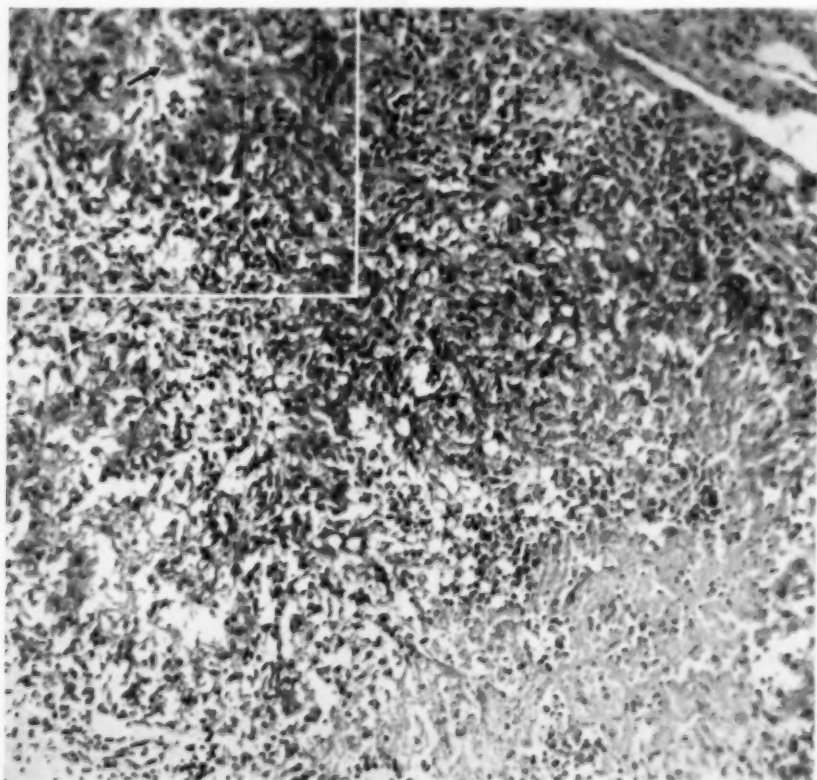


Fig. 3.—Granulomatous involvement of the lung of dog (case 2). Note necrosis (lower right) and spherule of *Coccidioides immitis* (upper left). $\times 135$.

was evidence of rib destruction which had repaired by massive exuberant callus formation. Roentgenographic examination of the right hind extremity (fig. 6) showed a calcific overgrowth involving the entire distal fourth of the tibia.

On necropsy, the essential findings were granulomas of the lungs (particularly of the pleural surfaces), the bones, and the liver. The lung lesions, in contrast to those of dog 2, were chiefly depressed scars. The bone lesions proved to be firm granulomatous tumors. Coccidioidal spherules were found in smears and tissue sections.

DISCUSSION

Case 1 illustrates the "valley fever" syndrome common in man in endemic areas, with a primary pulmonary involvement and subsequent recovery. While the majority of cases in man are of the self-limiting type, this (case 1) is the first such reported in a

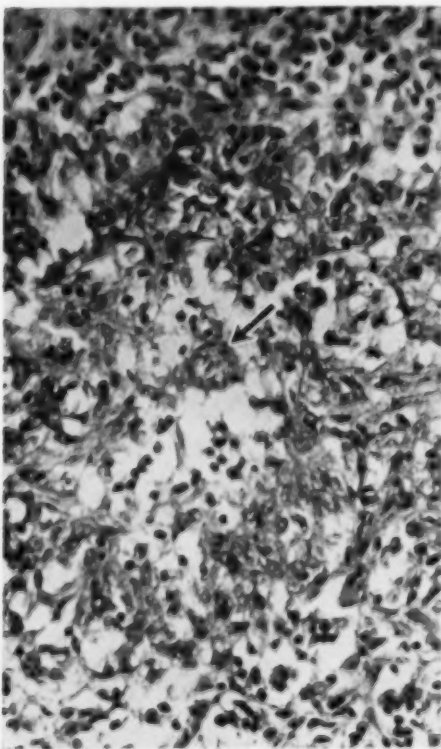


Fig. 4—Magnification of ruled area in figure 3. Granuloma of the lung (case 2) with central spherule of *Coccidioides immitis*. $\times 300$.

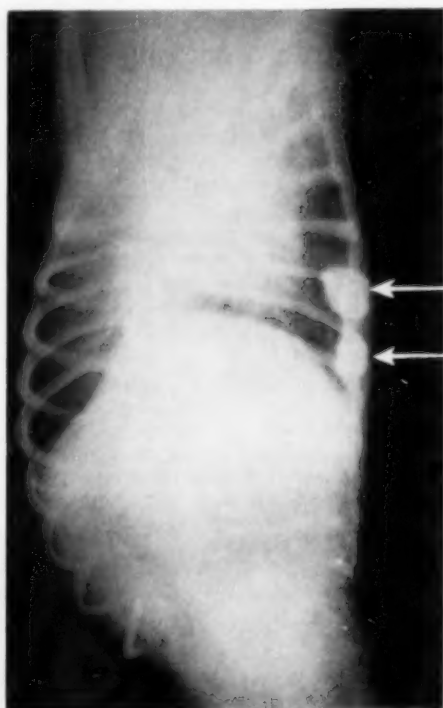


Fig. 5—Roentgenogram of dog (case 3) showing pulmonary involvement and calcific granuloma of the ribs.

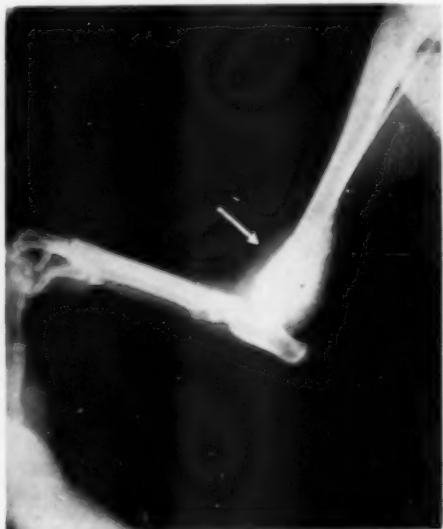


Fig. 6—Roentgenogram of right hind extremity (case 3) showing osseous coccidioidal granuloma.

dog. The presumptive diagnosis of primary pulmonary coccidioidomycosis in this case rested on the following clinical evidence: the high endemicity of the area; an acute pulmonary disease that failed to respond to treatment ordinarily effective in bacterial infections; the concurrent appearance in a kennel mate of a similar syndrome which progressed until it was disseminated throughout the dog's system (case 2); and roentgenographic findings consistent with the disease. The final diagnosis was made in the laboratory with the culturing of *C. immitis* and the demonstration of highly specific serological antibodies in significant titer.

Cases 2 and 3 represent dissemination of the disease subsequent to the original pulmonary infections. Case 2 is the first report of canine coccidioidomycosis in which the disease has been followed clinically from its onset as an acute respiratory infection, through its subsequent dissemination and fatal termination, with confirmation by postmortem examination. In this case, the disease ran a rapidly fulminating, fatal course.

In case 3 the dissemination was manifested as a more chronic wasting process with granulomatous metastases. Since the existence of a *C. immitis* infection had already been established by serological tests, a presumptive clinical diagnosis of metastatic osseous coccidioidomycosis was possible when bone lesions subsequently appeared. Necropsy confirmed this clinical impression. This is the second report of osseous coccidioidomycosis in a dog, the first having been a finding from a partial necropsy.⁶

These cases illustrate three widely divergent terminations of the disease and emphasize the impossibility of accurate early prognoses. Serological tests proved of value in establishing the diagnoses.

COMMENTS

That 3 cases of canine coccidiomycosis were recognized at one veterinary hospital in a brief period indicates that the paucity of reports is not a true reflection of the frequency of the disease in pets. Inasmuch as the dog may have a self-limiting pulmonary infection (case 1), it is possible that numbers of such cases in particular are going unrecognized.

Clinically, coccidioidomycosis should be considered in the differential diagnosis in any animal whose history indicates a possible exposure. Exposure history should include not only residence in an enzootic area, but the possibility of more transitory exposures such as travel through, or contact with animals or dust bearing fomites from, such areas.

Adjuvant evidence would be failure to respond to therapeutic measures ordinarily effective in pneumonias, roentgenographic findings consistent with the disease and/or metastatic granulomas. To confirm a presumptive diagnosis, examination of exudates for *C. immitis* by smears and cultures and serological tests should be employed.

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Propagating Viruses in Mammary Glands

When the virus of Newcastle disease or of influenza A was instilled into one quarter of a lactating cow, it could be demonstrated in the milk of that quarter for about two weeks but never from the other quarters or the blood. Soon after the virus disappeared, neutralizing antibodies which persisted for at least eighteen months were present in the milk of the experimental quarter and later in the blood and the milk from other quarters. Similar results were obtained when the virus was instilled into one mammary gland of a nonlactating cow and of a lactating goat. In the case of *Brucella abortus* infection, antibody production declined when the infected mammary gland was excised. Further research is planned for indications of why the antibodies persisted after these viruses disappeared.—*Canad. J. Comp. Med., Dec., 1954.*

Toxicity of Malathion and Chlorthion to Dogs and Cats

R. R. BELL, D.V.M.; M. A. PRICE, M.S.; R. D. TURK, D.V.M., M.S.

College Station, Texas

THE CONTROL of external parasites on animals is a serious problem. This is especially true since some external parasites apparently develop resistance to chlorinated hydrocarbon insecticides. In preliminary trials, the new phosphorus insecticides have shown promising results. Very little information is available on the toxicity of these compounds when applied directly to the animal body. This study was undertaken to determine if these compounds could be applied in sufficient strength to be effective against some of the common external parasites and still have an adequate margin of safety for the animal.

The only information available was the manufacturer's technical bulletins and one toxicity trial report.² Malathion (070 - dimethyl dithiophosphate of diethyl mercaptosuccinate) and chlorthion (0.0 - dimethyl -0.3 chloro -4- nitrophenyl thiophosphate) were used in the trials reported here. According to the manufacturer's technical bulletin,¹ the acute oral medial lethal dose (I.d.₅₀) for rats of 99 per cent technical malathion in corn oil is 1,845 mg. per kilogram of body weight. While 100 mg./kg. intravenously in dogs produced no apparent effect, 200 mg./kg. produced death. The minimum lethal dose (m.l.d.) as a single application to the skin of rabbits, which was washed off after eighteen hours, was more than 6,150 mg./kg. and less than 12,300 mg./kg. using 90 per cent technical material. The oral I.d.₅₀ for rats has been given as 1,500 mg./kg. in a comparison study.²

The oral toxicity of chlorthion has been given as 1,500 mg./kg. for rats.² Subacute toxicity studies indicate that daily intraperitoneal doses of 100 mg./kg. for approximately sixty days are required to produce the I.d.₅₀ for rats, while 50 mg./kg. similarly administered resulted in no mortality.

Apparently healthy dogs and cats were obtained from the city pound and kept in individual cages for these trials. The dogs were fed once daily. The appetite and

other visible actions were used to determine symptoms of toxicity. The dogs were observed for one hour after administration of the insecticide, then several times during the day, and at approximately 9:00 p.m.

MALATHION

Seven dogs were given malathion in doses varying from 500 to 3,500 mg./kg. orally, using 95 per cent technical material. All vomited within thirty-five minutes of administration and at no time showed any signs of toxicity. In an attempt to eliminate the vomiting, 3 dogs were first given a gastric sedative and then 1,500, 3,000, and 3,500 mg./kg. of the drug diluted in four volumes of peanut oil. All vomited within thirty-five minutes and showed no apparent signs of toxicity. Two dogs were given 3,500 mg./kg. orally via stomach tube and were then immediately anesthetized with sufficient sodium pentobarbital so that they remained under anesthesia for approximately twelve hours. The dogs recovered from the anesthesia and ate normally a few hours later. At no time were any apparent toxicity signs observed.

Four dogs were dipped four times at four-day intervals in a 2 per cent solution made by using 57 per cent emulsifiable solution of malathion. No apparent signs of toxicity were observed.

CHLORTHION

Four dogs were dipped in 2 per cent chlorthion solution by using the emulsifiable solution. The dogs showed no apparent signs of toxicity following the first dipping but four days later, when dipped again, all died within thirty-six hours.

Of 4 dogs dipped in 1 per cent chlorthion solution at four-day intervals, 1 died after the second dipping, 2 after the third dipping, and 1 after the fourth dipping.

When 5 dogs were dipped in 0.5 per cent chlorthion solution at four-day intervals, 1 died after the first dipping, and 2 after the third dipping. The 2 that remained alive after four dippings lost weight and appetite, and showed a slow heart rate, depression, and excessive salivation. They

¹Instructor (Bell), professor and head (Turk), Department of Veterinary Parasitology, and assistant professor (Price), Department of Entomology, A. & M. College of Texas, College Station.

vomited frequently after the fourth dipping.

Four dogs dipped in a 0.25 per cent chlorthion solution, at four-day intervals, at no time showed apparent signs of toxicity. Also, 4 cats dipped in a 0.25 per cent chlorthion solution at four-day intervals for four times showed no signs of toxicity.

DISCUSSION

All animals that survived the full course of dippings and the oral administration were held for three weeks, destroyed, and autopsied. No gross or microscopic lesions were observed that could be attributed to the insecticides used. All animals that died were autopsied and no lesions of toxicity were observed.

This conclusion indicates that malathion, used either orally or applied as a dip, has a low toxicity for dogs. It is realized that more animals must be used before conclusions can be drawn.

This trial indicates that chlorthion has a relatively high toxicity for dogs and is not safe to apply to the animal body. No attempt is made to explain the lack of postmortem lesions on animals that died during this trial.

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More on Tetanus Immunity Oddities

An authority is critical of an editorial in the Oct. 2, 1954, *Journal of the American Medical Association* (quoted in the *J.A.V.M.A.*, Jan., 1955, page 61) to the effect that "if given simultaneously, the antitoxin will interfere with the antigenic activity of the toxoid." He comments that "this is not supported by available evidence." He then quotes several authorities who found that the "simultaneous injection of 1,500 units of tetanus antitoxin—in man—did not in any significant degree interfere with the active immunizing stimulus of toxoid," but suggests that if 10,000 units or more of antitoxin were given with the first dose of toxoid, the effect of the toxoid

would be largely suppressed. The use of 1,500 units of antitoxin simultaneously with the toxoid has been extraordinarily successful over a period of ten years in the U. S. Armed Forces.—*J.A.M.A.*, Dec. 4, 1954.

Cause (Agene) of Canine Hysteria to Be Eliminated

Britain's Ministry of Food recently announced that the processing of flour with nitrogen trichloride (agene) for the purpose of bleaching it and increasing its keeping qualities was to end on Dec. 31, 1955. In 1946, it was shown that white bread made from flour thus processed was responsible for the chronic poisoning known as "canine hysteria" or "fright disease." A year later, it was found to cause similar symptoms in ferrets. However, there is no satisfactory evidence that this product has been harmful to man.—*Brit. M. J.*, Jan. 1, 1955.

Dirofilaria Immitis Larvae in Fleas

The larvae of *Dirofilaria immitis* were found in more than one third of the fleas collected from 71 dogs. When restricted to feeding on infected dogs, 98 per cent of the fleas became infected. The larvae apparently caused no serious tissue or organ injury and no apparent increase in the mortality of the infected fleas. Larvae in the infective stage were observed leaving an injured flea but they were incapable of penetrating an intact skin. When 28 fleas, in which 47 infected-stage larvae could be observed, were dissected after feeding on a dog, only 17 of the larvae remained. Three of the larvae were then found in puncture wounds caused by the feeding fleas. These insects are most likely the natural vectors of canine filariasis.—*J. Parasitol.*, Oct., 1954.

Treating Actinomycosis in a Dog

Actinomyces was demonstrated microscopically in an abscess in a dog's lumbar region, which persisted in spite of various local treatments and sodium iodide given *per os*. The abscess cleared up after four subcutaneous injections of 0.1 to 0.3 gr. of isonicotinic acid hydrazide plus irrigation with an iodine solution.—*Vet. Bull.*, Jan., 1955.

A New Ascaricide for Swine

GEORGE R. BURCH, D.V.M., and HARRY E. BLAIR, D.V.M.

New Augusta, Indiana

IT WAS observed during an anthelmintic screening program that cadmium exerted a lethal effect on swine ascarids.¹ This element had not been reported previously as an anthelmintic, so extensive studies were conducted on its affect against this parasite. To have wide acceptance, an ideal swine anthelmintic should be effective, safe, palatable, and convenient to use. Data presented in this paper are offered as evidence that aska-rid® meets all of these requirements.

METHODS AND RESULTS

Efficacy Study.—Routine flotation fecal examinations, using a saturated sodium chloride solution with centrifugation, were conducted to select parasitized animals for treatment. The cadmium oxide was mixed in ground corn and oats and fed dry. Only this form of medicated feed was fed to the animals before and during the various efficacy tests. All stools from the treated animals, which weighed from 45 to 85 lb., were examined for evidence of ascarids from the beginning of the treatment period until they were necropsied two weeks later.

Table 1 shows the various levels of cadmium oxide administered during feeding periods of twenty-four to ninety-six hours. In spite of the varying amount of cadmium oxide used (0.01 to 0.05%) and the length of treatment period (24 to 96 hours), an average efficacy of 91.2 per cent was obtained in the 52 pigs studied. The percentage of efficacy was calculated from the number of worms passed and found during the test as compared with the total number harbored by the animals (worms found on necropsy plus those passed and found during test).

Table 2 records the efficacy data that resulted when different amounts of cadmium oxide were administered to pigs from the same herd. To gain information on

the degree of parasitism in this herd, 8 animals (controls) were killed without treatment and were found to be harboring 159 worms, an average of 19 worms per pig (lot A). The average number of worms harbored by the treated pigs, based on the worms found in the feces and on postmortem examination, were: lot B, 4 worms; lot C, 5; and lot D, 9. The scattered condition of the feces indicated that the pigs had eaten some of the worms following passage. If the degree of parasitism in the treated pigs was approximately the same as the controls, the expected number of worms in the feces of group B was 265; group C, 247; and group D, 136. Group B (0.015% cadmium oxide for 3 days) actually showed an efficacy of 98 per cent on a basis of percentage of total worms found, but it would have been 99 per cent effective if compared with the worm load of the control group. For group C (0.02% cadmium oxide for 3 days), the efficacy was 87 per cent based on worms found or 96 per cent when compared to the controls and, for group D (0.02% cadmium oxide for 2 days), it was 68 per cent on basis of worms found or 86 per cent when compared with controls.

Table 3 presents efficacy information on a herd of 290, 65-lb. parasitized pigs. Six of these pigs (untreated) were killed and found to be harboring 97 worms, an average of 16 worms per pig. Following a three-day treatment (0.01 to 0.02% cadmium oxide), 1,703 worms, an average of 6 per pigs, were found in the feces of the remaining 284 pigs. Fourteen pigs were selected at random from this treated group and necropsy showed them to be completely

TABLE 1—Efficacy of Various Amounts of Cadmium Oxide Against Swine Ascarids Based on Necropsy

No. of pigs	Cadmium in feed (%)	Feeding period (hours)	Worms passed and found	Found on necropsy	Efficacy (%)
8	0.01	96	57	6	90
14	0.015	72	59	1	98
8	0.02	48	49	23	68
13	0.02	72	59	9	87
5	0.03	24	22	1	96
2	0.03	72	15	0	100
2	0.05	72	5	0	100

Dr. Burch is director, Pitman-Moore Co. Research Farm, New Augusta, Ind., and Dr. Blair is presently in practice in Brownsburg, Ind.

The authors express appreciation to Dr. Carl A. Bunde for his advice during this study.

*Aska-rid (anthelmintic powder containing 1.4% cadmium oxide) is a trademarked product of Pitman-Moore Co., Indianapolis, Ind.

TABLE 2—Efficacy of Cadmium Oxide-Medicated Feed in Pigs* from the Same Herd

Lot	No. of pigs	Cadmium in feed (%)	Days fed	Worms passed and found	Worms found at necropsy	Efficacy (%) compared to controls	Worms passed (%)
A	8	None	—	0	159	—	—
B	14	0.015	5	59	1	99	98
C	13	0.02	5	59	9	96	87
D	8	0.02	2	49	23	86	68

*Fecal examinations from this herd were all strongly positive for ascarids.

free of ascarids. Although the 6 control pigs indicated an average load of 16 ascarids per pig for the herd and the 14 pigs necropsied after treatment showed complete elimination, nevertheless only 6 ascarids per pig were found in the feces. This supports our contention that only a fraction of worms passed are found when pigs are treated with this product. It is possible too that many worms die in the intestine and are digested, so that a measurement of efficacy based on the number of worms found in the feces might be quite erroneous.

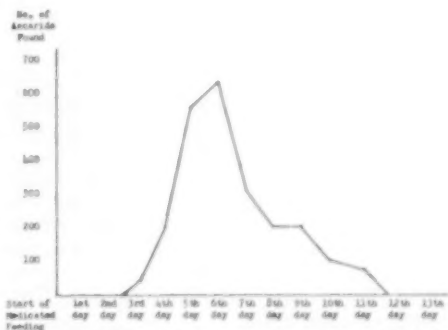
The curve in graph 1 demonstrates the pattern of ascarid passage that was obtained from 345 parasitized pigs following administration of ascarid medicated feed. This group included 336 pigs described in the efficacy tables and an additional 9 from another test. Ascarids were not observed in the stool until the third day of medication. The number of worms passed increased daily until the sixth day; thereafter, the count decreased gradually to zero on the twelfth post-treatment day.

Palatability and Safety Study.—Table 4 gives a comparison between the amount of unmedicated feed and feed containing varying amounts of cadmium oxide that normal pigs consumed. The ration used in this test was one to which the pigs were accustomed and the only deviation from the regular feeding program was the addition of cadmium oxide. These pigs readily consumed both feeds and showed no evidence that the medicated feed was unpalatable.

Table 5 presents the effect of cadmium oxide on palatability and food intake when added to ground corn and oats. Throughout these trials, the addition of cadmium oxide did not reduce the palatability of the ration, and evidence of reduced food intake or toxicity was not observed until a level of 0.03 per cent was used. When levels of cadmium oxide exceeded 0.03 per cent, food intake was reduced and evidence of vomiting and diarrhea was observed. The inclusion of high levels of cadmium

oxide, 0.03 per cent above, did not immediately result in unpalatability, but it did cause vomiting in approximately thirty minutes, after which the pigs would not eat the medicated feed.

Table 6 records the various types of feeding programs, including a "slop," that were used in an effort to produce toxic symptoms. Deliberate fasting periods prior to the various feedings failed to produce toxicity. This study indicates that this



Graph 1—Pattern of ascarid passage from 345 pigs following administration of cadmium oxide in the feed (total passage 2,023 worms).

TABLE 3—Efficiency of Cadmium Oxide-Medicated Feed Against Swine Ascarids

No. of pigs	Ascarid in feed	Worms passed and found	Worms found at necropsy	Efficacy
6	None	Not looked for	97	—
14	0.01 to 0.02% 5 days	Not looked for	0	100%
284	0.01 to 0.02% 5 days	1,705	Not necropsied	—

TABLE 4—Palatability Study Comparing Intake of Feed Containing Cadmium Oxide with Unmedicated Feed

No. of pigs	Weight (ave.)	Food eaten per 24 hr. per pig	
		Unmedicated	Medicated
8	54	2.25 lb.	2.31 lb. (0.02 %, 2 days)
6	56	2.5 lb.	2.66 lb. (0.02 %, 3 days)
6	49	1.84 lb.	2.6 lb. (0.015 %, 3 days)
8	42	2.65 lb.	2.5 lb. (0.015 %, 3 days)

TABLE 5—Effect on Palatability and Food Intake of Varied Amounts of Cadmium Oxide in Ground Corn and Oats When Administered to Swine Weighing 45 to 85 lb.

No. of pigs	Cadmium in feed (%)	Days fed	Observations
25	0.015	2	25 ate well.
247	0.015	3	247 ate well.
48	0.015	6	48 ate well.
105	0.02	3	105 ate well.
5	0.03	1	5 ate well.
4	0.03	3	4 ate well 1st day; some vomited second day; some of feed eaten 3rd day.
5	0.03	3	Food intake reduced by 1/2 lb. per pig per day.
9	0.04	3	Food intake reduced by 1/4 lb. per pig per day; diarrhea in some pigs.
3	0.05	1	3 vomited in 1 hr.; no further eating.
4	0.05	3	1 vomited in 1 hr.; ate with reluctance; diarrhea in some.
7	0.05	3	Food intake reduced by 1/3 lb. per pig per day; diarrhea in some.
6	0.3	1	6 vomited in 1/2 hr.; no further eating.
2	5.0	3	2 vomited in 23 min.; no further eating.

medicated feed can be administered safely in either the wet or dry form, using any type ration that is convenient to the farmer.

Table 7 presents data on a feeding experiment using a commercial pig ration. The 20 pigs used in the test were kept in the same pen, except for a three-day period when 10 of the pigs received the medicated feed. The gains recorded in the 23-day test indicated this treatment does not affect normal weight gains.

Table 8 shows that aska-rid medication can be safely administered to pregnant sows, as the 7 treated individuals during the last trimester of pregnancy averaged farrowing as many live pigs as did the controls.

Field Testing.—After research studies indicated that cadmium oxide could be conveniently used in various swine feeding

programs with efficacy and safety, a clinical testing program was undertaken. Practicing veterinarians were requested to treat ascarid-parasitized herds to find out if the medicated feed would be practical under routine farm practices.

The resulting field reports involving 8,577 pigs in 75 herds, including some herds with concurrent infections, were quite uniformly favorable. One herd of 105, 40- to 60-lb. pigs which had been affected with necrotic enteritis three weeks earlier ate an average of 3 lb. per day of medicated feed for three days. The feed consisted of ground corn and oats, supplemented to give it a 14 per cent protein content, and was fed as a slop in the morning and dry at night. Ascarids were seen in the feces following the second day of treatment. The pigs seemed to eat and gain better after treatment.

Another herd of 315, 80- to 100-lb. pigs, 85 of which had recently been treated for erysipelas, ate 3,600 lb. of a similar medicated feed in three days with good results. A third herd of 49, 45-lb. pigs which were affected with a hemorrhagic diarrhea, as well as being heavily parasitized with ascarids, were treated in spite of their condition without ill effects. They ate 450 lb. of medicated feed in three days and ascarids were observed in the feces on the fourth day. After the treatment, the diarrhea stopped and the condition of the herd improved.

COMMENT

Cadmium is absorbed from the intestinal tract, so it has been important in initial tests to use the lowest effective dose in order to minimize tissue concentrations. Research studies and field tests indicated that a 0.015 per cent feed mixture of cadmium oxide fed for three days was highly

TABLE 6—Toxicity of Cadmium Oxide to Swine When Administered in Various Types of Feeds

No. of pigs	Feed program	Observation
4	Ground corn and oats containing 0.015% aska-rid was made into a slop with evaporated milk (canned) and water for 48 hr.; fed free choice after a fasting period of 19 hr.	Feed readily eaten; no toxicity.
4	Ground corn and oats containing 0.015% aska-rid made into a slop with powdered buttermilk and water for 48 hr.; fed free choice after a fasting period of 18 hr.	Feed readily eaten; no toxicity.
4	Commercial pig and sow 18% protein ration containing 0.015% aska-rid fed free choice for 96 hr.; fed after a 17-hr. fasting period.	Feed readily eaten; no toxicity.
19	Ground corn and oats containing 0.015% aska-rid fed free choice after a 24-hr. fasting period.	Feed greedily eaten; no toxicity.
48	Ground corn and oats containing 0.015% aska-rid fed free choice for 148 hr.	Feed eaten without reluctance for entire period; no toxicity.

effective and produced low tissue concentrations;² thus, a powder containing 1.5 per cent cadmium oxide was selected as the final anthelmintic formulation with directions to mix with 100 lb. of feed. Assay of tissues from pigs receiving 0.015 per cent cadmium oxide-medicated feed for seventy-two hours revealed the cadmium content highest in the liver, kidney, and spleen. The cadmium levels in these tissues reached a maximum of 1 mg./100 Gm. in the animals killed the day after treatment, whereas the cadmium levels approached normal tissue limits in those animals killed thirty days following medication.

The effectiveness of this medication is wholly dependent upon the availability and consumption of normal amounts of feed over a 72-hour period. To emphasize this point, the Hampshire pigs used in the third efficacy test (table 3) were extremely alert with excellent appetites. The finding of 1,703 ascarids following treatment, with complete elimination of the parasite in all of the 14 pigs later necropsied, clearly indicates that adequate anthelmintic levels were gained.

Two problems were encountered in this work which may be of interest to others conducting swine anthelmintic studies. It was found that, in general, pigs have er-

TABLE 7—Weight Gains of Control and Aska-Rid Medicated Pigs

	Initial weight	Final weight	Total gain in 23-day test
Controls—10	442 lb.	840 lb.	398 lb.
Treated ^a —10	476 lb.	872 lb.	396 lb.

^aReceived aska-rid medicated feed for seventy-two hours prior to start of 23-day test.

TABLE 8—Effect of Aska-Rid Medicated Feed Administered to Sows During Last Trimester of Pregnancy

No. of sows	Medicated feed	Ave. No. days to farrowing after medication	Ave. No. per litter Live pigs	Dead pigs
7 ^a	8 lb. daily for 3 days	11.5	8½	1
24	None	.....	8½	½

^aOne sow lost 4 pigs at birth due to excess size of pigs, required manual assistance for delivery.

atic food intake when placed in individual pens. Apparently, these animals are so accustomed to competing with others for the food that segregation causes them to lose some interest in eating. Also, many of the pigs seemed to relish the worms passed in the stool. This is particularly disconcerting when the efficacy figures are based on the number of worms recovered from the feces following dosage.

Because ascarids are passed in the feces over a ten-day post-therapy period, it was not surprising to find many of the ascarids greatly deteriorated when recovered (fig. 1). Persons used to seeing normal asca-

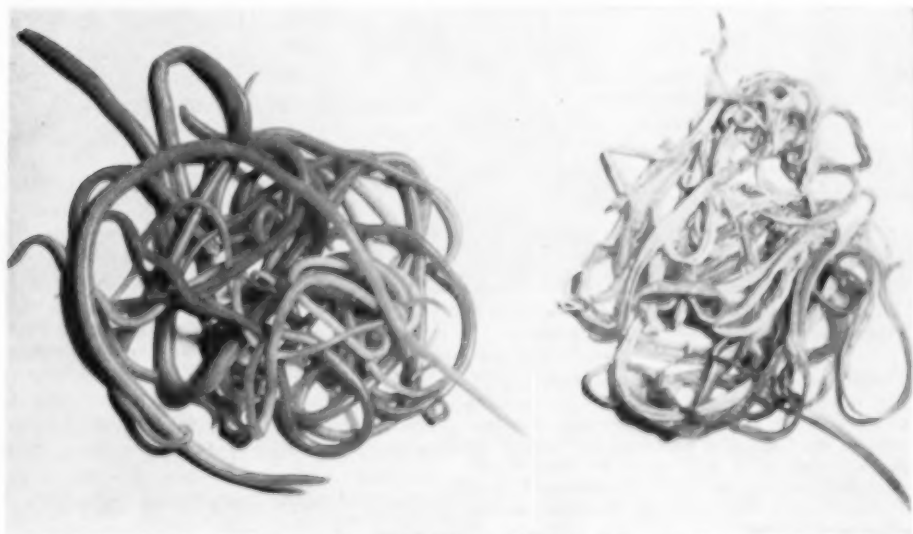


Fig. 1 (Left)—Normal swine ascarids and (right) ascarids obtained from the feces of pigs treated with aska-rid.

rids in the hoglot might not recognize the ascarids in their changed form following medication.

One of the most impressive observations made during this study was the palatability of aska-rid medicated feed. Only when cadmium oxide levels of 0.03 per cent and above were administered did the pigs begin to show a decrease in food intake. Even when high levels were incorporated into the feed, the mixture was readily consumed. Two pigs (table 5) received 5 per cent cadmium oxide in their feed in an attempt to produce fatal toxicity. Both pigs readily ate the feed but vomited within a few minutes and would not eat again of the feed over a three-day test period. Evidence of toxicity, when using the recommended 0.015 per cent mixture, did not occur in any of the field tests, even though many of the pigs treated were from herds suffering from concurrent infections. Field reports indicate that the pigs seemed to have an improved appetite after consuming the anthelmintic, also that when administered in slop it proved to be as safe and effective as when used in the dry form.

The data presented indicate that cadmium oxide meets the requirements of an ideal swine anthelmintic; it has a high degree of efficacy, can be given conveniently in all types of rations, and has a unique safety feature—emesis occurring when toxic amounts are consumed.

SUMMARY

The addition of 1 lb. of aska-rid (1.5% cadmium oxide) to each 100 lb. of ground feed produces an anthelmintic mixture that, when fed exclusively for seventy-two hours, is palatable, safe, and effective as a swine ascaricide.

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Correction in 1954 Proceedings Book

A typographical error occurred in the spelling of *effect* in the paper on "Performance of a Bacterin in the Control of Erysipelas in Turkeys" by A. C. Jerstad and E. E. Johns of Puyallup, Wash., published in the AVMA "Proceedings Book" (1954:333-337). The word was incorrectly spelled *affect* several times.

Brucellosis in Man and Animals in Iowa

Of the 2,047 cases of brucellosis in man in Iowa, in a three-year period (1951-1953 inclusive), the larger number occurred in counties with large packing plants. Of 720 cases with complete information, 51 per cent were male farm workers, 22 per cent were packinghouse employees, and 10 per cent were housewives, three fourths of whom lived in rural areas. The disease occurred most frequently in the late spring and early summer, with June the peak month and the incidence curve following about two months later than the sow-farrowing curve. Swine are apparently the principal source and the skin is an important portal of entry. About 80 per cent of the patients either came into contact with animals or animal excretion.—*Pub. Health Rep., Feb., 1955.*

Virus Infection in the Brain of Cats

A rapidly fatal disease of cats reported from Italy in 1951 was characterized by tremors, contraction of the lips and eyelids, ataxia, and paralysis, with death in six to twelve hours. Except for general congestion, the only lesions were in the cells of the central nervous system. Bacteria were not found but the disease was transmitted by intracerebral inoculation, kittens being more susceptible than adult cats.—*Vet. Bull., Dec., 1954.*

Transmission of Equine Infectious Anemia Virus to Sheep

Efforts to transmit the virus of equine infectious anemia to nonsoliped animals usually has failed. When 60 ml. of serum from horses in the febrile stage of the disease was inoculated subcutaneously into each of 5 lambs, each developed a fever and a reduction in erythrocytes. While only the 1 destroyed on the twenty-eighth post-inoculation day showed any typical lesions, blood taken on the fifth to tenth postinoculation days was infectious for horses, as was an organ emulsion taken from 3 lambs on the third to twenty-eighth days. Thus the virus can invade and persist in the organs of lambs for at least one month.—*Jap. J. Vet. Res., June, 1954.*

What Is Your Diagnosis ?

Radiograph Offered for Your Study and Diagnosis

Because of the interest in veterinary radiology, the JOURNAL publishes this month a case history and accompanying radiograph depicting a diagnostic problem. This is one of several cases reported in the *American Journal of Veterinary Research* (Jan., 1955:5-14) in the article by H. R. Seibold, W. S. Bailey, B. F. Hoerlein, E. M. Jordan, and C. W. Schwabe, of the Alabama Polytechnic Institute, Auburn.

Make your diagnosis from the picture below — then turn the page ▶



History.—A 3½-year-old male hound was experiencing chronic choke and vomiting when attempting to eat. Barium meal solution was given by mouth, a radiograph (fig. 1, above) was taken, and a thoracic operation was performed.

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

The radiograph (fig. 1) shows barium being retained in the lower esophageal region as the result of a tumorous mass. Also note the irregular exostosis and deforming spondylitis involving the ventral portion of several thoracic vertebrae

Following the "diagnosis" is an abstract of the original article (*Am. J. Vet. Res.*, Jan., 1955: 5-14) which describes 10 cases of esophageal tumor and accompanying deforming spondylitis that is thought to be the result of *Spirocerca lupi* infection.



Fig. 2—Incised *Spirocerca* lesion in the wall of the esophagus between site of tumor (indicated by surgical incisions) and gastric mucosa.

the region of lesions containing the parasite. In 3 dogs, no parasites were found on postmortem examination. However, the presence of deformative ossifying spondy-

Malignant Esophageal Tumors in Relation to *Spirocerca Lupi* in the Dog (An Abstract)

Reports of esophageal tumors in the dog are rare and are limited to the leiomyoma, the squamous cell carcinoma, and the fibrosarcoma. This report (see *Am. J. Vet. Res.*, Jan., 1955:5-14) deals with ten malignant tumors, seven described in detail and three in the addendum. Evidence is presented that *Spirocerca lupi* infection is an inciting factor of malignant esophageal tumors in dogs. In 9 of the 10 dogs, the tumor actually or apparently occurred in relation to *Spirocerca* lesions.

The tumors in 6 animals occurred in



Fig. 1—Fibrosarcoma from the esophagus of dog 1.

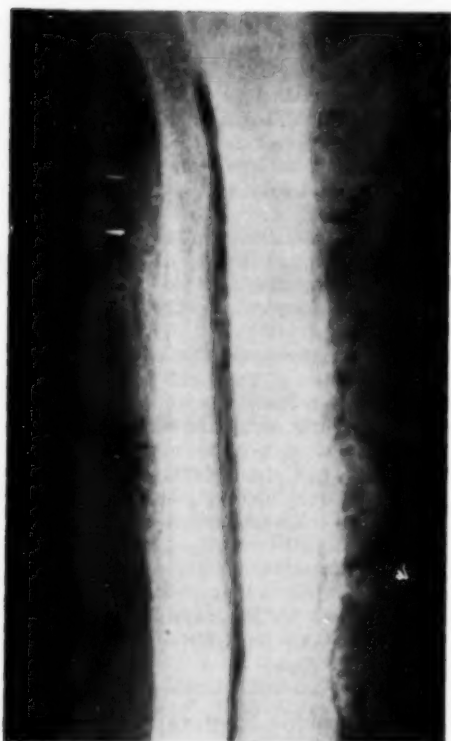


Fig. 2—A radiograph showing subperiosteal exostosis from dog 4 characteristic of hypertrophic pulmonary osteoarthropathy.

litis affecting the posterior thoracic vertebrae gave presumptive evidence of infection with *Spirocerca*. In 1 case, the tumor was a surgical specimen which was mailed to the laboratory with no information pertaining to *Spirocerca* infection. All ten tumors occurred in the region of the esophagus where *Spirocerca* lesions characteristically occur.

Three of the tumors were fibrosarcomas and seven were osteosarcomas. Four of the osteosarcomas and one of the fibrosarcomas had metastasized. Hypertrophic pulmonary osteoarthropathy was found associated with three fibrosarcomas and three osteosarcomas. Three illustrations are reprinted from the original article, which show some of the lesions found (fig. 1, 2, 3).

It is of further interest that spondylitis usually is seen in the lumbar and cervical regions; these two areas are where the



Fig. 3—Osteosarcoma in esophagus of dog 3. Notice two nodules (probably due to *Spirocerca lupi*) immediately below tumor.

spinal column is most flexible and, therefore, most subject to "wear and tear." In the esophageal tumor, the spondylitis is directly above the lesion. Furthermore, the finding of posterior thoracic spondylitis in the absence of lumbar and cervical lesions is diagnostic evidence that *S. lupi* infection may have been the inciting factor of malignant esophageal tumor.

Vitamin D Prevents Parturient Paresis

Levels of vitamin D, varying from 5 to 30 million units per day, in the form of irradiated yeast and viosterol were fed to cows subject to parturient paresis for three to eight days prepartum. Some protection resulted from levels of 5 and 10 million units while 20 and 30 million units per day gave complete protection. Thus, 30 million units per day for at least three days, but not for more than seven days prepartum and one day postpartum, offers a simple, safe, and effective method of protection against parturient paresis.—*J. Dai. Sci., Jan., 1955.*

Strangulated Testicle of a Cryptorchid (Dog)

PAUL T. WHITE, D.V.M., and
PETER JOHNSON, JR., D.V.M.

Indianapolis, Indiana

A 5-month-old male Boston Terrier was presented for examination on Oct. 11, 1954. Two days previously, the owner reported that the dog was distressed and often howled and trembled. The right side of his

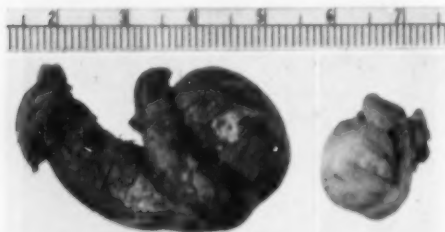


Fig. 1—Testicles of a 5-month-old Boston Terrier, a cryptorchid; the one on the left is strangulated.

abdomen was tender, and he vomited and showed a dislike of going up and down stairs.

When presented, the animal appeared to be in good physical condition, bright and alert, but the thorax was expanded and the abdomen was spastic. It was ascertained that the dog was a bilateral cryptorchid. Palpation of the abdomen produced a wincing and pain, but after continuous mild pressure, the abdominal muscles relaxed and a small, firm mass about 3 cm. in diameter could be palpated midway between the xiphoid cartilage and the os pubis. A radiograph, taken with the thought that the abdominal mass might be a foreign body or possibly a diaphragmatic hernia, was negative for both.

An exploratory laparotomy was undertaken. Under nembutal® anesthesia, a trachea tube was inserted and oxygen inhalation equipment readied in the event a diaphragmatic hernia was present. When the incision was completed no diaphragmatic hernia was found, but a black, reddish mass, partly covered by adherent omentum, was located and brought into view. The adhesions were broken down

and the mass was identified as a hemorrhagic testicle, approximately four times the normal size. It was brought through the incision with difficulty due to adhesions in the region of the left kidney. The cord was ligated and the testicle removed. The right testicle, which was normal in size and appearance although not descended, was also removed.

The peritoneum and muscle layers were closed with an interrupted mattress suture, using No. 0 cotton. The skin incision was closed with simple interrupted cotton sutures.

When the owner was told of the strangulated condition of the right testicle, he related that for the past sixty days the dog had frequently exhibited what could be interpreted as abdominal pain.

The dog was placed in a small cage and prevented from licking the wound by a small metal collar around its neck. Recovery was complicated by a slight respiratory infection and temperature rise, but this responded to daily administration of 1.75 cc. of combiotic® for five days and, thereafter, 300,000 units of penicillin at 48-hour intervals for six days.

The Use of Hog Cholera Biological Products

The trend in the use of the various biological products in the immunizing of swine against hog cholera is indicated by the annual reports of the quantities of these products used. The amount of sales of virulent hog cholera virus, stated in 1,000,000-cc. units, was in 1950—103; in 1951—100; in 1952—73; in 1953—45; and in 1954—39. The combined doses of the various modified and inactivated vaccines, stated in millions of doses, was for the last six months of 1951—5; in 1952—11; in 1953—17; but the total is not given for 1954. However, 13 million doses were sold during the first six months of 1954 compared with 9 million doses in the same period of 1953. The amount of hog cholera antiserum released, stated in units of 1 million cc. was: in 1950—1,619; in 1951—1,611; in 1952—1,127; in 1953—883; and in 1954—800. While the production of virulent virus in 1954 was only 38 per cent of that in 1950, the production of hog cholera antiserum also was reduced to about 49 per cent of 1950.

Drs. White and Johnson are small animal practitioners in Indianapolis, Ind.

The Effect of Hyperimmune Hog Cholera Serum on the Virus of African Swine Fever

DONALD E. DeTRAY, D.V.M., and GORDON R. SCOTT, M.S., M.R.C.V.S.

Kabete, Kenya, East Africa

MONTGOMERY¹ first described African swine fever (ASF) in 1910 and recognized the clinical similarity of this disease to hog cholera (European swine fever). He failed to protect pigs against the African virus using doses of hog cholera serum up to 60 ml. He reported also that pigs hyperimmunized to hog cholera died when injected with the African virus. Nevertheless, Montgomery regarded the African disease as a hyperacute form of swine fever (hog cholera). Other workers²⁻⁴ similarly failed to protect pigs against ASF with hog cholera serum, and Conceicao⁵ concluded that hog cholera and ASF were two entities with some points of anatomicopathological and clinical similarity but entirely differing in their antigenic nature.

However, DeKock, Robinson, and Koppel⁶ found that 50 ml. of hog cholera serum injected simultaneously with the African virus appeared to delay the onset of symptoms but failed to protect against death. In addition, these workers reported that *in vitro* incubation of a small dose of ASF virus with hog cholera antiserum appeared to neutralize the virus. They felt that their results indicated a common antigenic factor between the two viruses.

The report by Dale *et al.*⁶ on variants of hog cholera virus revived interest in the possible relationship between hog cholera and ASF. These and other investigators^{7,8} pointed out that protection against variant hog cholera viruses necessitated increased doses of hog cholera antiserum. The following *in vivo* and *in vitro* experiments were therefore undertaken.

MATERIALS

The virus was the first laboratory passage of the Hinde strain isolated in August, 1954, from a field outbreak of ASF in Kenya. Virulent blood had an

l.d.₅₀ titer for pigs of $10^{5.2}$, i.e., each milliliter contained 3,000,000, 50 per cent lethal doses. Three brands of commercial hog cholera serum were used. They were produced in the United States and tested for potency under supervision of the Animal Disease and Parasite Research Branch, ARS. Normal serum was collected from hog cholera-susceptible swine and 0.5 per cent phenol was added. Large White pigs, weighing 40 to 60 lb., were used. They were raised in the ASF-free area of Kenya. Large White pigs are not indigenous to Africa and the original stock was imported from England.

EXPERIMENTAL RESULTS

Experiment 1.—This experiment was an attempt at *in vivo* neutralization of ASF virus by the simultaneous inoculation of hog cholera serum. Each pig received 3,000,000 l.d.₅₀ of virus. The amounts of serum used and the results of the inoculation are shown in table 1. Up to 300 ml. of hog cholera serum had no effect on the course of the disease induced by 3,000,000 l.d.₅₀ of ASF virus.

Experiment 2.—The dose of ASF virus was reduced to 100 l.d.₅₀ to determine if hog cholera serum would protect against a lighter virus challenge. In addition, control pigs were inoculated with normal serum and ASF virus to compare their reactions with pigs receiving similar doses of hog cholera serum and ASF virus. The amounts of serum used and the inoculation results are shown in table 2. A comparison

TABLE 1—Effect of Different Doses of Hog Cholera Serum on African Swine Fever Infection

Hog cholera serum dose (ml.)	First day of illness postinoculation	Day of death postinoculation
30	3	6
150	2	7
300	4	7
None	4	6

TABLE 2—A Comparison of the *in Vivo* Effect of Hog Cholera Serum and Normal Swine Serum on 100 l.d.₅₀ of African Swine Fever Virus

Serum dose	First day of illness postinoculation	Day of death postinoculation
100 ml. hog cholera serum	4	8
100 ml. normal swine serum	4	8
250 ml. hog cholera serum	4	8
250 ml. normal swine serum	4	7
None	5	8

Dr. DeTray is with the Animal Disease and Parasite Research Branch, Agricultural Research Service, U.S.D.A., and Dr. Scott is with the Department of Veterinary Services, Kenya, East Africa.

This paper is published under the terms of a Memorandum of Understanding between the Department of Veterinary Services, Kenya, East Africa, and the U.S.D.A., ARS, Animal Disease and Parasite Research Branch. Permission of both parties to publish is gratefully acknowledged by the authors.

TABLE 3.—Comparison of Attempted *In Vitro* Neutralization of African Swine Fever Virus by Hog Cholera Serum and Normal Swine Serum

Virus dilution	Hog cholera serum		Normal swine serum	
	Reaction	Challenge	Reaction	Challenge
10 ⁻⁴	*	—	*	—
10 ⁻⁵	*	—	—	*
10 ⁻⁶	—	*	—	*
10 ⁻⁷	—	*	—	*
10 ⁻⁸	—	*	—	**

* = febrile reaction and death; ** = febrile reaction and recovery; — = no reaction.

of hog cholera serum and normal swine serum showed that both were equally ineffective in altering the course of the disease induced by 100 i.d.₅₀ of ASF virus.

Experiment 3.—*In vitro* neutralization of ASF virus with hog cholera serum was attempted. Serial tenfold dilutions of the virus were made so that the addition of equal amounts of undiluted hog cholera serum provided final virus dilutions of 10⁻⁴ through to 10⁻⁸. A control test, using normal swine serum, was similarly and simultaneously set up. The serum-virus mixtures were held at 8 C. for three hours and then at 37 C. for thirty minutes. After the incubation period, 1 ml. of each dilution was inoculated into pigs. Nonreacting pigs were shown to be susceptible to ASF by contact challenge. Table 3 shows the results. Hog cholera serum failed to neutralize ASF virus *in vitro*.

DISCUSSION

The results indicated that ASF is distinct from the variants of hog cholera described in America because death occurred invariably following the inoculation of ASF virus irrespective of the amount of hog cholera serum given simultaneously. We were unable to confirm the South African suggestion⁵ that there was an antigenic relationship between hog cholera and ASF. However, we feel that the effect of ASF antiserum on hog cholera virus must be determined before accepting Conceicao's⁶ conclusion that the two viruses differ entirely in their antigenic nature.

SUMMARY

Hyperimmune hog cholera antiserum had neither an *in vivo* nor an *in vitro* effect on African swine fever (ASF).

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A Jockey Club Panel Discussion

At Saratoga, N. Y., on Aug. 22, 1954, a panel of 18 members, representing all interested groups, discussed race track problems. Veterinarians were represented by Drs. J. G. Catlett (USC '16) of Forest Hills, N. Y., and Jordan Woodcock (UP '38) of Port Chester, N. Y. The consensus seemed to be that official track veterinarians should not do private practice during the racing season, except in emergencies. With respect to the horsemen having hypodermic equipment, the consensus was to "let the veterinarians use the needle."—*Blood Horse*, Nov. 20, 1954.

Phenothiazine in Grub Control

Investigations at the United States Regional Animal Disease Laboratory, Auburn, Ala., indicate that phenothiazine may have value in preventing the development of the common cattle grub, *Hypoderma lineatus*, after it has entered the animal's system. When fed, on a free choice basis, 0.1 to 2.7 Gm. per head daily during the heel fly season, mixed with 3 parts each of bonemeal, limestone, and salt to 1 part of phenothiazine, 6 cattle had an average of 8 mature grubs each, while 6 controls had an average of 36 each.—*U.S.D.A., Dec., 1954*.

NUTRITION

Canine Nutrition

THOMAS J. JONES, D.V.M., Ph.D.

Athens, Georgia

BEFORE CANINE nutrition can be intelligently discussed, the available literature must be reviewed for specific information regarding the present needs of the animal and the materials that can best supply these needs. We can then explore an area that has not been given a great deal of study, the subject of "interference with normal nutrition." The factors which enter into this are not directly concerned with normal nutrition as we understand it. It is important, though, that all veterinarians understand and be familiar with both normal and pathological nutrition, if it can be interpreted as such.

REVIEW OF LITERATURE

McCay,¹ in his excellent book, "Nutrition of the Dog," gives a complete list of references, the vast majority representing results of experiments done during the twentieth century.

Some good, fundamental physiological experiments were conducted during the 1800's, but they were largely in connection with physiological experiments for nutrition in man. The majority of the work published was done by workers in Germany, France, and the United Kingdom. After the turn of the century, workers in the United States became concerned with canine nutrition, chiefly because the dog was being used as an experimental animal. Since little information was available, interpretation of results was often difficult. In 1900, nutritionists working in the human field had stimulated much interest in the requirements for proteins, energy, fat, and minerals. From 1900 to 1920, extensive work was done on the amino acids, minerals, fat metabolism, and energy requirements and, from 1920 to 1940, on vitamins.

Although the present information seems to be relatively adequate for formulating a balanced ration, there is still much that we can not satisfactorily explain in regard to the nutritional factors of the dog. Relatively little of the work done on the enzyme systems is directly applicable to canine nutrition, but it may be a fertile field if explored. Labeling compounds and certain foods with radioactive isotopes may furnish valuable information.

Dr. Jones is dean, School of Veterinary Medicine, University of Georgia, Athens.

With regard to the promiscuous addition of antibiotics to the feeds which are being sold today, their indiscriminate use may sensitize animals, nullifying the subsequent therapeutic value of these agents.

Many able workers have devoted much time to determining the nutritional requirements of dogs. The basic needs of the healthy dog from puppyhood to maturity can now, with few exceptions, be determined with reasonable accuracy. Dogs, like all other animals, demand adequate amounts of proteins, carbohydrates, fats, minerals, and vitamins, with an ample water supply.

Arnold and Elvehjem² in 1937 compared 18 samples of commercial dog food, seven proving adequate and 11 nutritionally inadequate. The same authors³ in 1939 found, after a critical study on a small number of dogs, that the total food requirements of grown dogs are approximately twice their maintenance requirements, also that dogs require about twice the amount of phosphorus needed by most domesticated animals. Nearly all herbivorous animals require a ratio of two parts calcium to one of phosphorus while dogs require the reverse.

In 1940, Morgan⁴ was critical of the source of the materials which were used as dog food. She also evaluated the available material as sources of vitamins for dogs. The literature states that dogs do not need a supplementary source of vitamin C. However, we have seen many cases of dermatitis which would respond to no therapy until the dog was given an injection of ascorbic acid. It is possible that some factors other than vitamin C are involved, but this should certainly be investigated further.

Much of the work on foxes and mink has been applied to dogs, but whether their requirements are identical, is open to question. Active dogs, such as Greyhounds or hunting and working dogs, may have considerably different needs than animals which have a minimum of exercise.

Linton⁵ suggests that a ration too low in protein may bring on other deficiencies. The shortage of meat during World War II emphasized the critical need for information regarding the protein requirements of growing puppies.

In 1947, Heiman⁶ reported original work showing that growing pups require 20 per cent of the dry weight of their food to be protein of good source.

Also in 1947, Morris⁷ reported his observations

on the protein requirements of the hospitalized dog. Since our information is drawn chiefly from work done on the normal puppy or healthy dog, the needs of hospitalized animals are not too well established. Morris observed that recuperating dogs in the hospital should be fed small quantities of easily and quickly digested protein of high biological value from such sources as eggs, meat, or milk.

The disease of canine hysteria, or "running fits," was frequently observed in Georgia about 1930 and was seen often until the late 1930's when it was firmly established that the condition was of dietary origin. It was concluded that if a dog were given ample feed with an adequate supply of protein of animal origin, this condition could be either eliminated or avoided. The subject is reviewed¹ and evidence indicates that the "agene process of heating wheat products is responsible for this condition." In other words, the small amount of nitrogen trichloride gas that found its way to the feed was "hysteriagenic," and when wheat flour, not heated, was fed, dogs did not develop "running fits."

Another condition, "black tongue" of dogs, attributed directly to nicotinic acid deficiency, has generally disappeared as the standard of living of the affected area has improved. Twenty years ago, it was a common sight in every small animal hospital in the Southeast. Today, as with "running fits," there are not enough cases to provide sufficient material for teaching about such diseases.

Robinson,² reporting on ten generations of dogs, has given extensive reports on feeding for gestation and lactation, with the general condition of the dog being the chief criterion evaluated.

DRY AND CANNED FOODS

Michaud *et al.*¹⁰ in 1947 published an excellent discussion on the value of dry or canned dog foods. Canned food can be conveniently stored and dry feed kept in rat-proof containers will remain palatable for a considerable length of time. The value of baking the dry feed lies outside the scope of this paper, but most manufacturers of dry feed have resorted to baking in order to cook the starch. Also, the food which has been baked keeps better and is freer from molds. However, no one has shown that raw feeds, properly formulated, can not be considered nutritionally adequate.

Workers at the Alabama Experiment Station reported that raw foods were as efficient as cooked or canned foods. Many packs of Foxhounds fed on raw, mixed grain rations, ad-lib were worked hard. One criticism of such a ration was that it was not as palatable as desired and that their total consumption was not enough to keep the dogs in running condition. A similar

group of hounds did eat enough when the feed was cooked as a mush in a large kettle over an open fire, with cabbage or collard greens added as an appetizer. Hounds not exercised outside the pens could maintain their weight satisfactorily on the raw ration.

RESOURCES FOR DOG FOODS

Waste products of former years are now being salvaged and prepared as dog food. The canned dog food industry of the early 1930's, an even later, received its great stimulus from the availability of large quantities of cheap meat. Beef and pork were cheap and there was little, if any, demand for much of the offal and glandular organs so they were salvaged as dog food. Meat meal was mixed with by-products of the breakfast food industry making a good, palatable, nutritious food for dogs and cats which was marketed as a 20 to 24 per cent protein food.

As the price of beef and pork rose, the price of draft horses dropped. Thus, literally millions of horses have been slaughtered and canned as dog food. A shortage in the supply of horses has developed, so the dog food industry has had to search for new sources of protein foods. Shortly after World War II, there was a great increase in the growth of the poultry industry, especially in broiler production, creating a large number of broiler-packing houses. The by-products of this industry are now used in dog foods.

It would seem proper to point out two facts which may become significant. The first is that most broilers today are raised on rations with high antibiotic content and there may be enough of these antibiotics in the offal to sensitize the dogs fed this material. The second is that chicken-packing by-products are, at present, high in bone content, providing a calcium and phosphorus ratio reversed for the needs of the dog, unless the manufacturers supplement the feed as it is packed.

The need for more and continued research on dog food is obvious. Critical studies are needed to determine the minimum requirement of all vitamins and their relationship to virus and bacterial diseases and to skin conditions. The same questions must also be answered in regard to fatty acids. The needs of the dam during gestation and lactation should also be considered.

Above all, the work should be done on the dog and not on a species of laboratory animal, or the information may be useless when applied to the dog.

FACTORS WHICH INTERFERE WITH NORMAL NUTRITION

Before discussing the factors which interfere with normal nutrition, they should be enumerated. There may be others, but these have proved to be most important at the clinic of the School of Veterinary Medicine, University of Georgia. As applied to the young puppy, or to the dog under one year of age, the factors which interfere with nutrition are: (1) ration of dam during gestation and lactation; (2) intestinal parasites (hookworms, coccidia, roundworms, tapeworms); (3) inflammatory processes of the intestinal tract; (4) palatability (taste, poor appetite, vitamins and minerals); (5) low digestibility (starches, high fiber); and (6) inactivity of hospitalized dog.

Ration of Dam During Gestation and Lactation.—If the ration of the dam during gestation has been adequate to nourish the puppies so that they are whelped with sufficient stores of vitamins and minerals, her milk will contain all of the necessary elements for the proper nutrition of the pups. On the other hand, if the ration has been lacking in any of the essential elements, they will grow poorly and may be thin and emaciated. The continual crying of newborn puppies may be caused by an inadequate diet.

If the ration of the bitch was deficient in vitamins or minerals during gestation, the newborn pups will have rough, dry coats, and the skin may be wrinkled and covered with minute blisters. The puppies usually show signs of pain, probably of neurotic origin. More often than not they have a slight diarrhea. The death rate is high and a whole litter will often succumb during the first few days. No amount of vitamin therapy seems to do any good in these cases. In borderline cases, a high percentage of the pups may be smothered, apparently being too weak to get out from under the bitch. In a valuable litter, one can sometimes give whole blood intraperitoneally with fairly good results. It is, at present, the only recourse in these cases.

Intestinal Parasites.—The damage that is done to the mucous membranes of the

intestinal tract by moderate to heavy infestations of hookworms, coccidia, roundworms, and tapeworms is frequently in direct proportion to the number of parasites that have invaded the tissues. Monnig¹¹ states that hookworms are capable of sucking 0.75 cc. of blood every twenty-four hours. Thus, if a dog has 100 hookworms, he may lose 75 cc. of blood every twenty-four hours. Obviously, all of the nutrition in the world could not save him.

Coccidia inhabit the mucous membranes just under the surface. Extensive hemorrhage, which they cause, debilitates the animal while the irritation causes diarrhea and an inflammation of the mucosa. The intestinal walls are thickened, interfering with absorption. The animal becomes greatly dehydrated and deficient in protein, making it a poor risk when placed in any hospital.

Some practitioners are prone to ignore the presence of roundworms until they become a problem. In young puppies they frequently block the lumen of the intestine. They not only may interfere with absorption and cause irritation and thickening of the intestinal walls but they absorb much of the nutrient that should go to the host. If the result is the death of the host, the cause is frequently given as parasitism when, actually, it is malnutrition or starvation.

The presence of large numbers of tapeworms usually occurs in young dogs 6 months to 1 year old. Seldom does a pup younger than that have a heavy infestation of tapeworms. Their presence and their method of attaching themselves to the walls of the intestine cause considerable irritation and hemorrhage. The result is inflammation, interference with absorption, and malnutrition.

Inflammatory Processes of the Intestinal Tract.—There are a great many factors which can, either directly or indirectly, cause inflammation of the intestinal tract. Nearly all of the infectious febrile diseases, especially those of the so-called "distemper complex," can cause severe, bloody diarrhea, with the entire length of the animal's intestinal tract being highly inflamed. Consequently, the animal suffers from loss of blood, dehydration, proteinemia, and an almost complete loss of energy. In these cases, immediate intravenous or subcutaneous medication to supply nourishment

to the animal is imperative. Dextrose, 5 to 10 per cent, and saline solution can be given together with some form of soluble, isotonic protein. In cases of severe debilitation, nitrogen and energy in the form of glucose must be available almost immediately if the animal is to be saved. This is especially true of both very young and very old animals.

Palatability.—By "palatability" we generally mean the readiness with which an animal accepts a certain food. We usually associate the word with taste, but taste is acquired. Palatability is associated with the food itself, something which can not be readily separated from it. Certainly we have not explored this phase of canine nutrition, and there is reason to believe that a great deal could be learned if we do so critically. Another word which is closely associated with palatability and food is "appetite." Here, again, we are at a loss for a true definition. We consider appetite as the desire to eat, but how much is it influenced by taste and palatability?

Low Digestibility.—We know a little about the degree of digestibility of raw starches and foods of high fiber content, but these factors need much further study to determine to what extent they really interfere with nutrition.

Inactivity of Hospitalized Dog.—Another problem is the sudden inactivity of the hospitalized dog. We take a dog from an active, everyday existence, confine him to a 3- by 4-ft. pen, and expect all of his body functions to perform as they always have. Such a procedure is not scientific, yet it is done and then we wonder why the dog failed to eat or respond to treatment.

Certainly, anyone who has studied nutrition of the dog can ask many more questions than we are capable of answering. We must direct attention toward these unsolved problems so that others will benefit by our curiosity.

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Affect on Foals of Feeding Aureomycin

Twelve Thoroughbred foals born in a period of three months and maintained together were alternately assigned as principals or controls. The principals received 100 mg. of aureomycin® hydrochloride per day as electuaries from birth to 3 months and 200 mg. per day from 3 to 9 months of age. All were weaned at 5 months and observed until 13 months of age. The principals showed a growth advantage of 14.1 per cent at weaning time, 10.5 per cent at the end of treatment, and 7.0 per cent at the end of observations. The affect at maturity remains to be seen, but there was no improvement in the utilization of food and no alteration in bone development as indicated by x-ray examinations.—Vet. Rec., Nov. 27, 1954.

Strip Grazing on the Increase

In 1954, an estimated 700 Wisconsin dairymen were using the strip-grazing method for pasturing their dairy cows, a method which was practically unheard of in 1950. This practice is increasing in other states also. The advantages are a better quality of, and up to one-third more, forage per acre and less trouble with bloat since the cattle eat the stems as well as the leaves. By this method, the more improved pasture, such as alfalfa-Ladino-broom grass mixtures can be used. The area should be limited so that it will be grazed down to 6 inches but not closer than 4 inches in two days; the fence then should be moved.—Successful Farming, Feb., 1955.

EDITORIAL

Dispensing Versus Merchandising in Veterinary Practice

Two committees of the AVMA (the Committee on Ethics and the Special Committee on Veterinary Supply Problems) have emphasized the need for clear understanding of the differences between *dispensing* and *merchandising*, including display advertising of veterinary products.

Such an understanding is important since dispensing is a recognized, essential part of adequate veterinary service while merchandising and display advertising are not. Merchandising is highly unprofessional and not in the best interests of the livestock industry, or of animal owners.

Why is merchandising and display advertising unprofessional? Not just because it violates the spirit of the Principles of Veterinary Medical Ethics, but because it contradicts the traditions and lowers the moral standards of the veterinary profession. Practicing these professional principles protects the public from the advertiser and salesman of animal health products by establishing an easily discernible, generally recognized distinction between the merchandiser and the ethical veterinarian.

The well-informed livestock and pet owner of today expects his veterinarian to meet certain definite standards. He feels he is entitled to the services of: (1) a highly professional man who has a sympathetic and practical understanding of the general problems of animal owners; (2) a man who is skilled in the diagnosis and treatment of animal diseases; (3) a person whose surgical skill and knowledge are comparable to those who engage in human surgery; (4) a man whose integrity and earnest desire to serve his clients to the best of his ability are self-evident; and (5) one who puts service above self. These are the criteria by which our profession is judged. The obligation to use all of the specialized knowledge and skills required

to determine the needs for professional service is inherent in all phases of practice. The practice of therapy, surgery, preventive medicine, or dispensing without having first made a diagnosis is completely inconsistent with these standards.

Those who promote and condone treatment of disease without diagnosis are either so naive they do not recognize facts, or they are deliberately attempting to deceive and exploit the livestock industry regardless of the consequences.

When pharmaceutical and biological products are sold without the benefit of any effort at competent diagnosis, it is merchandising, pure and simple. When an occasional veterinarian resorts to such practice, he places himself on a level with feedstores, drugstores, and others who, by their wide-scale promotion and sale of veterinary supplies, are confusing the public and victimizing the livestock owners. The merchandiser of such products has only one motive, namely—substantial profit, and the buyer of these products has little or no assurance that his money has been well spent or his problem solved. In fact, his difficulties may be greatly multiplied.

There are several ways in which the veterinarian can combat the bad influence and effects of merchandising and display advertising of veterinary supplies without lowering himself to the standards of a merchandiser. This can be done: (1) by giving the dispensing branch of his practice the important place it deserves, which can be accomplished by maintaining an attractive, convenient office and drug supply room with a complete line of veterinary supplies dispensed in a professional manner; (2) by placing special emphasis on careful diagnosis in all phases of his practice, which, in many instances, can be done by consultation with the livestock owner and without it being necessary for him to see the sick or affected animals; (3) by practicing and supporting public relations efforts which are conducted in his behalf by his local professional group, by veterinary

This editorial was submitted as a part of the activities of the AVMA Special Committee on Veterinary Supply Problems. Members of the Committee are: Drs. Frank B. Young, chairman; R. O. Anderson; H. G. Geyer; R. C. Klussendorf; P. E. Madsen; and Kenneth Whittington.

associations, and those with alert interests at the state and national levels; and (4) by providing, under certain circumstances, well-equipped, all-purpose veterinary hospitals through which a complete, competent service can be offered to animal owners.

As adequate veterinary services expand, the livestock industry and the pet-owning public will increasingly recognize the value of ethical, professional conduct and its contribution to their welfare.

There always will be attempts on the part of the untrained to infringe upon the field of veterinary medicine, often without realizing that it is done at the expense of the livestock industry as well as veterinary science. However, if the practitioner gives his community the proper kind of service and keeps alert to the dangers from within as well as from without his ranks, the sound practices of veterinary medicine will not be replaced by superficial methods or shortcuts aimed primarily at the pocket-books of the livestock industry.

A New Interest in Animal Mycoses

A marked increase in the concern about fungi and the diseases they produce is evident and for this, antibiotics are largely responsible. The interest of mycologists was stimulated by the isolation of antibiotics from fungi of which there are many thousands of species. Since most of those species are either saprophytes or parasites of plants and only a few hundred species are parasitic for animals, medical groups have not been particularly interested. But with increasing incidence of fungous infections of man and animals, often as secondary invaders after bacterial infections have been reduced with antibiotics, the medical groups have become primarily concerned.

An example of a serious mycosis, which apparently may follow the careless use of antibiotics, is cryptococcal bovine mastitis which may be more common than is as yet realized. Other animal mycoses of concern to veterinarians are: actinomycosis, actinobacillosis, aspergillosis, blastomycosis, coccidioidomycosis, histoplasmosis, and ringworm. Moniliasis (*Candida albicans* infection) and sporotrichosis have also been reported.

Another such infection, mucormycosis, is

also receiving attention. Gleiser¹ reported 3 cases, 2 in dogs and 1 in a heifer, and in this issue of the JOURNAL (pp. 261-267) is a report indicating how the lesions of mucormycosis may be confused with those of tuberculosis. With tuberculin reactors in cattle close to the 0.1 per cent level and total eradication in sight, such lesions assume significance.

Referring again to antibiotics, it might be well to mention that a group of new ones, only slightly active against most other microorganisms, have a marked fungicidal effect. This is indicated by their names which include fungicidin, candicidin, and trichomycin. Like streptomycin which has shown activity against actinomycosis, they have been isolated from the streptomycetes.

¹Gleiser, Chester A.: Mucormycosis in Animals, J.A.V.M.A., 123, (Nov., 1953): 441.

New Rules for Handling Hog Cholera Antiserum and Hog Cholera Virus

The Agricultural Research Service, U.S.D.A., has ruled that modified and inactivated hog cholera viruses are viruses within the meaning of the Marketing Agreement Act. These fall within two categories: (1) those inactivated by exposure of the virulent virus to certain chemicals until unable to multiply while retaining their ability to stimulate antibodies; and (2) those modified by serial passage of the virulent virus through an unnatural host or mediums until it loses its ability to produce the disease but not its immunizing properties. It is necessary to use a small amount of hog cholera antiserum with some modified viruses. These products, because of a minimum time lag of six to eight days in establishing immunity, are not intended for use in an outbreak of the disease. It is thus necessary that substantial and available inventories of hog cholera immune serum be maintained. The serum and virus have in the past been produced at an approximate ratio of 15:1, with producers being required to maintain proportionate reserves. The new viruses have upset this ratio so it is necessary that a new pro rata basis for serum reserves be established.—*Fed. Register*, Nov. 18, 1954.

CURRENT LITERATURE

ABSTRACTS

Canine Malignant Esophageal Tumors

Evidence is presented that *Spirocerca lupi* infection is an inciting factor of malignant esophageal tumors in dogs. Seven malignant esophageal tumors are described; three additional tumors of like character are mentioned in the addendum. In 9 of the 10 cases, the tumor actually or apparently occurred in relation to *Spirocerca* lesions.

The tumors in 6 animals occurred in the region of lesions containing the parasites. In 3 dogs no parasites were found on postmortem examination. However, the presence of deformative ossifying spondylitis affecting the posterior thoracic vertebrae gave presumptive evidence of infection with *Spirocerca*. In 1 case, the tumor was a surgical specimen mailed to the laboratory with no information pertaining to *Spirocerca* infection. All ten tumors occurred in the region of the esophagus where *Spirocerca* lesions characteristically occur.

Three of the tumors were fibrosarcomas and seven were osteosarcomas. Four of the osteosarcomas and one of the fibrosarcomas had metastasized. Hypertrophic pulmonary osteoarthropathy was found in association with the three fibrosarcomas and three of the osteosarcomas. There is a highly significant difference in the incidence of malignant esophageal tumors in *Spirocerca*-infected dogs as compared with dogs without evidence of infection.—[H. R. Seibold, W. S. Bailey, B. F. Hoerlein, E. M. Jordan, and C. W. Schwabe: Observations on the Possible Relation of Malignant Esophageal Tumors and *Spirocerca lupi* Lesions in the Dog. *Am. J. Vet. Res.*, 16, (Jan., 1955): 5-14.]

Growth of the Capon's Comb

Combs of White Leghorn capons were surgically separated into two half-combs. A daily dose of 2 μ g. of testosterone propionate was applied to both half-combs and simultaneous applications of various doses of estrone were made to one. The steroids were applied for five days. Half-combs treated with estrone in daily doses of 100 or 200 μ g., but not with 80 or 160 μ g., grew significantly less than their paired controls receiving only testosterone propionate. Histological development of the cockerel-type comb occurred in half-combs receiving only testosterone propionate, but the development was markedly depressed in the corresponding half-comb treated with the estrone-testosterone propionate mixture. It is concluded that, under conditions of this experiment, estrone acted by antagonizing the action of testosterone propionate at the target tissue level. Relative proportions

of hormones present may be an important feature in determining the type of response to the mixture.—[John E. Martin, John H. Graves, and F. C. Doban: Local Inhibition by Estrone of Testosterone-Induced Growth of the Capon's Comb. *Am. J. Vet. Res.*, 16, (Jan., 1955): 141-146.]

Histopathological Findings in Cows Infected with *Leptospira*

In a histopathological study of organs from 15 Hereford cows which had aborted several months previously following spontaneous infection with *Leptospira pomona*, the most prominent pathological finding was an extensive chronic focal interstitial nephritis. The inflammatory cells consisted of small and large lymphocytes and, less frequently, polymorphonuclear neutrophils and eosinophils. Renal tubular cell proliferation was a common finding; where it was associated with a defective or dissolved basement membrane, the proliferating tubular cells formed bizarre syncytia and giant cells. A few unequivocal leptospiras were seen in sections of kidney from 6 of the 15 cows; of the kidneys which contained leptospiras, two were taken from cows that had contracted leptospirosis at least three months previously. Hemosiderosis was the most frequent finding in the spleen. Of hepatic lesions, limited portal and interlobular mononuclear cell infiltration was observed most frequently. No significant changes were present in the lungs and uteri.—[W. J. Hadlow and Herbert G. Stoener: Histopathological Findings in Cows Naturally Infected with *Leptospira Pomona*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 45-56.]

Identification of *Vibrio* Fetus

Approximately 164 isolates of *Vibrio* organisms from aborted fetuses and from the reproductive tracts of cattle were tested for metabolic by-products and growth characteristics. Two distinct types of vibrios were found: (1) catalase-positive organisms which were thought to be true *Vibrio fetus*; and (2) catalase-negative vibrios which were not incriminated as causing abortion or infertility in animals. Both types reduced nitrates to nitrites. The catalase-positive vibrios did not produce H_2S nor grow in deep stab cultures; whereas, catalase-negative vibrios produced H_2S and grew in deep stab cultures. Also, serological tests showed little or no relationship between the two types of *Vibrio* organisms.—[J. H. Bryner and A. H. Frank: A Preliminary Report on the Identification of *Vibrio Fetus*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 76-78.]

Procurement of Pigs by Hysterectomy

A technique is described for obtaining disease-free antibody-devoid baby pigs. The dam is anesthetized with carbon dioxide gas two to six days before expected parturition based on known breeding dates. The gravid uterus is removed surgically and passed intact into an enclosed bacteriological-type hood for removal (birth) of the baby pigs. These pigs are handled to prevent exposure to disease and are fed modified cows' milk from pans from the first day. Colostrum is not essential because there is no exposure to disease. Mortality among pigs is considerably less than that encountered among pigs nursing their dam. The dam is killed immediately after removal of the pigs and is processed for food. Experimental and practical uses for pigs obtained by hysterectomy are discussed.—[George A. Young, Norman R. Underdahl, and Ronald W. Hinz: *Procurement of Baby Pigs by Hysterectomy*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 123-131.]

Cultures of Human-Type Tubercle Bacilli

In two experiments involving cultures of the human-type tubercle bacilli of ages varying from 2 to 12 weeks, the heated culture filtrates were tested on cattle artificially sensitized with heat-killed *Mycobacterium tuberculosis* var. *bovis* or *Mycobacterium paratuberculosis*. The data obtained were analyzed statistically and showed that the skin reactive principle increased with age; that after a five- or six-week incubation period the amount of reactive principle had nearly reached a maximum; and, in one experiment, unconcentrated culture filtrates were as potent as their concentrated partners derived from the same batch of cultures.—[L. A. Baisden, A. B. Larsen, and T. H. Vardaman: *The Influence of Age of Human-Type Tubercle Bacilli Cultures on the Potency of the Culture Fluids*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 170-172.]

Effect of Transmissible Gastroenteritis on the Metabolism of Baby Pigs

The effect of transmissible gastroenteritis infection upon feed consumption, water, nitrogen, sodium, and potassium balances, and blood constituents of 6 young pigs was investigated. Six pigs were maintained as noninfected controls. The pigs were 26 days of age at the time of infection. The incubation period, as measured by the appearance of vomiting or diarrhea, varied from twenty-four to seventy-two hours. All the infected pigs showed symptoms of the disease. The pigs lost an average of 4 per cent of their body weight during the last two 24-hour periods. Feed consumption, weight gain, blood glucose, and the amount of water, nitrogen, sodium, and potassium retained were decreased by the infection. Following infection, the fecal water was increased fortyfold and hemoglobin values were slightly increased. There was no elevation in the average temperature of the

exposed pigs. The heart, liver, kidney, spleen, and intestine weights were calculated as percentage of body weight and comparison of these values for the infected with noninfected pigs revealed no differences.—[Elwood F. Reber and C. K. Whitehair: *The Effect of Transmissible Gastroenteritis on the Metabolism of Baby Pigs*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 116-119.]

Insufflation of the Stomach of Sheep

This work was done to determine physiological changes occurring during gaseous insufflation of the ruminant stomach. It is hoped that the findings may throw some light on the cause of death in acute tympany (bloat) in cattle and in sheep.

The studies were grouped under five divisions: (1) arterial blood pressure and arterial blood gases—carotid blood pressure was elevated, but if intraruminal pressures were maintained for several minutes at a high level, the blood pressure became depressed. This varied according to the gas used, and variations were also noted in individual sheep. The same sheep varied from day to day. Carotid CO₂ varied sharply, increasing, then decreasing abruptly when intraruminal pressures were lowered by eructation. Carotid O₂ decreased slowly as the intraruminal pressure increased. (2) During insufflation, jugular and cerebrospinal fluid pressures rose sharply. There was a transient rise in intrapleural pressures caused by closure of the glottis during eructation. (3) Pulmonary circulation time decreased during insufflation; however, the experimental time was brief. (4) Arteriovenous blood gas differences maintained a constant ratio. The comparison was not good since single samples of jugular blood were compared with continuous carotid samples taken at the same time. The fluctuations in blood gases were less evident in jugular than in carotid blood. (5) During severe insufflation, there was a decrease in oxygen utilization; however, conditions of the experiment made it impossible to keep animals in anything approaching the basal state. The values should be accepted only as trends.—[R. W. Dougherty, Courtney D. Meredith, and Robert B. Barrett: *Physiological Effects of Insufflation of the Stomach of Sheep*. *Am. J. Vet. Res.*, 16, (Jan., 1955): 79-90.]

FOREIGN ABSTRACTS

Use of Acetyl-Methionine in Large Animals

The authors report the beneficial results following the intravenous administration of 50 to 100 cc. of a 20 per cent solution of acetyl-methionine in cows affected with severe ketosis and calcium-refractory parturient paresis. The drug's antilipotropic and stimulative properties on the liver are believed to be responsible for the good results. The work of Gotze in Germany and Vigue in America with amino acids in these metabolic disorders is reviewed and confirmed.

Acetyl-methionine has also been found valuable

as an adjunct in the treatment of grass tetany, hepatic toxicoses following verminifuges, and parasitic hepatitis. The recommended dose can be repeated every forty-eight hours.—[P. Courbet, M. Clouet, and L. Touratier: *L'Acetyl-Methionine. Essais d'applications thérapeutiques dans quelques syndromes et affections à retentissement hépatique chez les grand animaux. Rec. Méd. Vét.*, 2, (Aug.-Sept., 1954): 478.]—R.F.V.

Radiographic Diagnosis of Osteogenic Sarcoma

Early cases of osteogenic sarcoma are difficult to diagnose according to the writers. Unless the neoplasm is well developed, a series of radiographs taken eight to ten days apart is required for correct diagnosis. Early cases are frequently mistaken for arthritis, benign tumors, osteomyelitis, periostitis, or exostoses as a consequence of inapparent bone injuries.

The principal radiographic characteristics of osteogenic sarcomas are listed as fuzziness of the osseous borders, sharp demarcation between healthy and diseased tissues, cortical destruction with severe periosteal reaction, and numerous bony spurs so fine that they resemble a tuft of hair or a grass fire on the periphery of the neoplasm.—[M. Fontaine and C. Bruder: *Diagnostic Radiographique de l'Osteosarcome. Rec. Méd. Vét.*, 2, (Nov., 1954): 701-704.]—R.F.V.

BOOKS AND REPORTS

General Pathology

The fourth edition of Frei's "General Pathology for Veterinarians" appears as a new, completely revised textbook, reflecting the rapid development and scope of this phase of veterinary science.

In the first chapter, which deals with general etiological causes of diseases, various internal and external factors are discussed. Further chapters are devoted to general pathological anatomy and general pathological physiology, which are discussed in excellent detail. This clearly written edition contains a wealth of good illustrations.

It represents one of the best veterinary general pathologies of the present time and may serve as a textbook not only for students but as an aid and guide for practitioners. It is a splendid and fundamental contribution to the veterinary profession.—[*General Pathology for Veterinarians and Students of Veterinary Medicine (Allgemeine Pathologie für Tierärzte und Studierende der Tiermedizin)*. By Walter Frei. 345 pages, 122 illustrations. Paul Parey, Berlin and Hamburg, Germany. 1955. Price not given.]—F. KRAL.

Comparative Anatomy of Domestic Animals

The second volume of this "textbook" describes the anatomy of the following internal organs of horses, cattle, sheep, goats, swine, and dogs: di-

gestive organs, respiratory organs, urinary and genital organs, and endocrine organs.

The description is relatively superficial, resulting, of course, from a limited size of this publication of 173 pages, many of which are occupied by many large illustrations, all of which are just simple drawings, often schematic and semischematic.

Veterinary anatomy is one of the most important basic sciences of veterinary medicine. Considering this publication as a textbook which has to be used by the students, it appears to be too superficial. However, it may serve as a help for repetition.—[*Anatomy of the Domestic Animals (Lehrbuch der vergleichenden Anatomie der Haustiere)*. By J. Dobberstein and T. Koch. 173 pages, 189 illustrations. Vol. 2. S. Hirzel Verlag, Schubmachersgasse 1-3, Leipzig C 1, Germany. 1954. Price not given.]—F. KRAL.

Experimental Studies in Equine Infectious Anemia

This monograph is essentially a compilation of much of the pertinent information available on different aspects of equine infectious anemia gleaned from the findings of investigators from all parts of the world, which has been presented in connection with a report on the work carried out on this disease by the authors and their co-workers at the School of Veterinary Medicine, University of Pennsylvania, under the sponsorship of the Grayson Foundation.

The first six of the 14 chapters are devoted to a brief discussion of such aspects of the disease as the history, distribution, transmission, symptomatology, clinical diagnosis, the properties of the virus, and laboratory diagnosis. The next eight chapters deal chiefly with the investigations conducted by the authors and their co-workers relating to studies on hematology, hemagglutination, pathogenesis, transmission to laboratory animals, culture of the virus, immunization, and histopathology. The final chapter is devoted to therapy and control. The extensive bibliography, consisting of 1,246 references, is one of the most important features of the monograph.

The concise information presented relative to our current understanding of the disease, the authors' report of their own investigations which are a valuable addition to our knowledge of the disease, and the extensive bibliography compiled from the world's literature on the subject should be of value to those interested in infectious diseases of the horse, and especially to students and research workers interested in solving the problems associated with this insidious disease for which, to date, there is no reliable laboratory diagnostic test, vaccine, preventive, or curative treatment.—[*Experimental Studies in Equine Infectious Anemia*. By Miklós N. Dreguss and Louise S. Lombard. 203 pages, 28 illustrations, 16 tables. University of Pennsylvania Press, Philadelphia. 1954. Price \$6.50.]—C. D. STEIN.

Infectious Diseases of Poultry

The author states in the introduction of the publication that the subject matter discussed includes only the more important infectious diseases of poultry and that it is presented in outline form since the information is not readily available in a concise treatise.

The author follows no definite style or order in discussing each disease or various aspects of the respective diseases. Discrepancies in spelling exist and subject titles in the table of contents do not agree with the subject titles in the outline proper. Accepted scientific nomenclature for the respective diseases has been overlooked. Also, the outline proper would be improved if scientific rather than lay terminology were used.

A few relative unimportant diseases might have been deleted in favor of the more common infectious diseases. Also, the validity of some scientific statements may be questioned.—[*An Outline of the Infectious Diseases of Poultry*. By Frank H. Manley. 83 pages. Burgess Publishing Company, 426 S. Sixth St., Minneapolis 15, Minn. 1954. Price not given.]—HENRY VAN ROEKEL.

The Nature of Virus Multiplication

This text consists of 16 contributions by authorities in the various phases of virology, with interesting discussions and excellent reference lists for each.

These contributions are concerned with virus multiplication in relation to metabolism, nucleic acids, protein synthesis, role of mutation, formation of incomplete virus, and radiobiological methods. The influence of divalent metals on phage multiplication and the analysis and nature of phage multiplication are also discussed.

Particular emphasis is given to the treatment of the multiplication of the influenza virus group, insect viruses, fowl tumor viruses, and neurotropic viruses.

Excellent photomicrographs, graphs, and charts are utilized in presenting the text material. The text is clearly written and the controversial information is presented so that the reader is given a balanced picture.

This book is particularly recommended for research workers, instructors, and students in virology.—[*The Nature of Virus Multiplication*. Ed. by Sir Paul Fildes and W. E. Van Heyningen. 320 pages. Cambridge University Press, New York, N. Y. Price \$6.50.]—SAM G. KENZY.

Introduction to the Pathogenic Anaerobes

In this newly published handbook, the author has presented a great deal of essential information about the often neglected pathogenic anaerobes. This edition contains 16 chapters, 13 of which are discussions of specific anaerobic organisms. In these chapters, Dr. Smith has capably described the occurrence, identification, morphology isolation,

cultural characteristics and requirements, toxins, and the diseases of man and animals produced by each organism. Special attention has been given to the toxic antigens produced by many of the pathogenic anaerobes. The chemical, physical, and pathological properties and characteristics of the toxins are reviewed and discussed from the standpoint that they are the mechanisms of pathogenesis.

Chapter 1 is devoted to a discussion of the methods and mediums essential to an understanding of the metabolic requirements of the pathogenic anaerobes. In the following chapter, the taxonomy and identification of the anaerobes are reviewed. The next nine chapters are devoted to a study of the toxigenic and pathogenic *Clostridium*. Considerable attention has been devoted to a discussion of the toxic antigens produced by the six recognized types of *Clostridium perfringens*. Actinomycetes, the bacterioides, the anaerobic streptococci, and fusospirochetes are reviewed in subsequent chapters.

Each chapter is supplemented with a selection of references which provide an excellent introduction to the literature. The many bibliographic references included in this book are taken from the widely scattered literature dealing with animal and human pathology and medicine.

This textbook will be a valuable aid to the laboratory worker and the student of anaerobic bacteriology.—[*Introduction to Pathogenic Anaerobes*. By Louis D. Smith. 253 pages. University of Chicago Press, Chicago, Ill., 1954. Price 7.50.]—L. A. GRINER.

Canine Medicine

"Canine Medicine" contains the views of 40 capable authors on the important diseases and relative conditions of the dog. The text covers clinical examinations, diagnostic aids, and specific diseases. Special emphasis is given to nutrition in the newborn, the mature, and the old dog. Diets for correcting nutritional deficiencies are also mentioned. Viruses, allergies, mycoses, rickettsias, toxic agents, and tumors are given a comprehensive review. The book has 213 fine illustrations.

It is divided into 26 chapters. Each topic gives a review of the literature, symptoms to be expected, prognosis, the author's experience, and suggested treatment. The editors are to be commended for this undertaking. It represents careful planning and fine coordination.

The book is largely written by practitioners for practitioners, but it is also prepared as a text for the classroom. It will serve as a reference book for those engaged in the treatment of diseases of the dog.

"Canine Medicine" is to be highly recommended for it is by far the best work available in this field.—[*Canine Medicine*. By forty authors. 631 pages. 213 illustrations. American Veterinary Publications, Inc., Evanston, Ill. 1953. Price \$12.50.]—WAYNE H. RISER.

Motion Picture Films

The rapidly expanding use of motion picture films available on subjects of interest to veterinary groups and the increased demands made for information concerning these films resulted in the establishment of an AVMA Special Committee on Motion Pictures.

The first tasks of the committee were to review and evaluate films available through the AVMA Film Library and to catalog those recommended for distribution.

In order to make this information a matter of permanent record for all AVMA members, the reviews and other pertinent data concerning films are published herewith. Reprints will be available on request.

Reviews of additional films, including those available from other sources, will be published in future issues of the JOURNAL.

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Motion Picture Films Available from AVMA Film Library

Approved by the AVMA Special Committee on Motion Pictures

Arrangements for showing a film should not be completed until a confirmation of booking notice is received. Book your films as far in advance as possible to avoid last-minute delay.

AVMA films are available for use only within the continental limits of the United States; and the showing should be limited to one time unless special arrangements are made through the AVMA Film Library.

Address all inquiries to:

Film Library
American Veterinary Medical Association
600 S. Michigan Ave.,
Chicago 5, Ill.

Anthrax in Ohio

16 mm. Sound	Color; Running time 25 min.	Produced by Ohio Dept. of Agric., U.S. BAI, FCDA, Ohio V.M.A., and the AVMA	Rental \$2.50
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The story of this film is how anthrax was diagnosed and controlled in Ohio in 1952. It shows how the definitive diagnosis was first made, how the spread and occurrence were investigated, how the disease was controlled, and how contaminated, foreign bone meal was finally incriminated as the causative agent.

The film also shows veterinary medical civil defense in action. The part played by the practitioner, the federal and state control agencies, and the laboratories in setting the civil defense machinery into motion is depicted in the film and described in the narration.

This motion picture should be most useful for showing to veterinarians as a part of their civil defense training. Certain autopsy scenes may be too "gory" for lay audiences but, in general, it can be used for that purpose too.

The film, primarily of informational value, is recommended for veterinary students, agricultural groups, and other lay audiences.

Bluetongue

16 mm. Sound	Color; Running time 9 min.	Produced by U.S.D.A. and California Dept. of Agriculture, Sacramento, Calif.	Rental \$2.00
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This film describes the history and shows the geographical distribution of the disease. It shows the symptoms, lesions, and pathology characteristic of bluetongue. The method of field and laboratory diagnosis is discussed as well as the other diseases that must be differ-

entiated from bluetongue. The film briefly describes the epizootiology including insect transmission, hosts, and communicability. Means of prevention and control are included.

This film should be useful in providing visual information to the veterinary student on this hitherto foreign disease now known to be established in this country.

Canine Clinical Cases

16 mm. Silent	Color; Running time 13 min.	Produced by Dept. of Small Animal Surgery and Medicine, A.P.I., Auburn, Ala.	Rental \$2.50
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This film depicts a series of clinical cases. The photography is excellent and the choice of cases is good. The film would be better if the treatment and the prognosis of some of the cases were shown. The cases described are keratoma, emphysema, rickets, laceration of pharynx, leukemia, sinusitis, and severe laceration of lower lip. They are interestingly presented, and where the treatment is shown along with the recovery they are especially good. The autopsy of the leukemia case is well photographed and adds much to the picture. This film is probably most valuable for the instruction of veterinary students, for which it is designed, but will also be worthwhile for showing at meetings of veterinarians.

Control of Bovine Tuberculosis in California

16 mm. Silent	Color; Running time 20 min.	Produced by California Dept. of Agriculture, Sacramento, Calif.	Rental \$2.00
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This film depicts the various phases of the bovine tuberculosis eradication campaign in California.

Starting with the technique of the tuberculin test, the viewer is shown the intradermic injection of tuberculin, reaction to tuberculin, identification of reacting animal, preparation of necessary reports and forms, disposal of reactors, and cleaning and disinfection procedures for infected premises and trucks.

There are many excellent shots of tuberculous lesions encountered at postmortem inspection. Proper disposal of infective unwholesome carcasses is emphasized, as is the importance of the California meat and milk inspection program.

It is recommended for professional, allied professional, and agricultural groups; the pathology of tuberculosis, as shown, limits the use of this film for lay audiences.

East Coast Fever

16 mm. Sound	Color; Running time 20 min.	Produced by Film Services, Union Education Dept. & Vet. Res. Inst., Onderstepoort, Union of South Africa	Rental \$1.00
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East Coast fever is a virulent and highly fatal protozoal disease of cattle (theileriasis), characterized by focal hyperplasia of the lymphatic tissues. The causative agent is *Theileria parva* and the vector is the tick. East Coast fever is one of the most serious diseases of cattle in Africa.

This film gives the history and distribution of the disease. It describes and shows the means of transmission (tick), the symptoms and pathology, the methods of diagnosis and control measures. The life cycle of the tick involved in transmission of the disease is well shown; photography of the tick is excellent.

The film is recommended for showing to professional and lay audiences.

Fighting Foot-and-Mouth Disease in Mexico

16 mm. Sound	Color; Running time 20 min.	Produced by Information Division, Joint Commission for the Eradica- tion of Foot-and-Mouth Disease	Rental \$1.00
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This film depicts the story of the battle against foot-and-mouth disease in Mexico. The picture shows the obstacles presented by the terrain, jungles, and the backwardness of many of the people in the remote areas of Mexico. The extreme importance of the domesticated animals to the very existence of the Mexican farmer is stressed, as are difficulties encountered due to the absence of modern methods of communications.

Veterinarians will be especially interested in portions of the film showing symptoms,

lesions, and the spread of the disease; also, the parts explaining the difficulties associated with the procurement, production, and administration of the vaccine.

Laymen and veterinarians will find the outline of the organization of the Joint Commission, the battle forces, and procedures of the campaign interesting and informative.

The film should explain more thoroughly how the slaughter and quarantine phases of the campaign were continued after vaccination was added to the program.

It is recommended for professional and lay audiences.

Heartwater in Farm Animals

16 mm. Sound	Color: Running time 15 min.	Produced by Union Education Dept., & Vet. Res. Inst., Onderstepoort, Union of South Africa	Rental \$1.00
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Heartwater is a septicemic, infectious, noncontagious disease of sheep, goats, and cattle, characterized by a high fever and nervous symptoms. In sheep and goats, hydropericardium is the most common lesion; this is not always true in cattle. The causative agent is *Rickettsia ruminantium* and the vector is the bont tick.

This film shows the distribution of the disease. It describes and shows the symptoms of the disease, means of diagnosis, methods of spread, and measures for control. By means of magnification, the life cycle of living ticks is shown.

The film is recommended for professional and lay audiences.

It Pays to Take It Easy

16 mm. Sound	Color: Running time 14 min.	Produced by Allis Chalmers Manufacturing Co., West Allis, Wis.	Rental \$1.50
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The purpose of this film is to show the need for proper handling of livestock in loading and shipping to prevent bruising and crippling.

The film features two 4-H teams from Faribault County, Minnesota, which demonstrate, through the use of community surveys, charts, and the construction of model equipment and farm-size loading chutes, improved practices at the farm level that will increase farm profits by reducing the number of bruised, crippled, and dead livestock.

Since the film is in color, the portion showing sample cuts of bruised beef is particularly striking in demonstrating resultant losses. This film should be useful to veterinarians in speaking to lay groups, especially of livestock producers and truckers.

Laboratory Diagnosis of Rabies

16 mm. Sound	Black and white; Running time 8 min.	Produced by Communicable Disease Center, U.S.P.H.S., Atlanta, Ga.	Rental \$1.00
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This picture shows clearly and in considerable detail the steps involved in the complete laboratory examination for rabies. The opening of the skull, removal of the brain, sectioning of the brain, making impressions, staining, examinations of the slides, and photomicrographs of the Negri bodies are the steps shown in the microscopic examination. The mouse inoculation and a mouse with rabies are also shown. The examination of brains of mice for Negri bodies and a photomicrograph of the Negri bodies complete the picture.

This is an excellent training film for those who are interested in learning how to conduct a complete laboratory examination for rabies. Practicing veterinarians will be able to review the steps taken in the laboratory for the detection of rabies in the specimens which they submit. Not an entertaining film—not designed for that purpose—but a good, educational film well photographed and well narrated.

It is recommended for professional audiences only.

Local Anesthesia in the Canine

16 mm. Silent	Color: Running time 11 min.	Produced by Dept. of Small Animal Surgery and Medicine, A.P.I., Auburn, Ala.	Rental \$2.50
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This film depicts the site for injecting local anesthetics on the skeleton and the live dog. Techniques depicted are epidural anesthesia and blocking of the maxillary, mandibular, infraorbital, and frontal nerves. The areas anesthetized are demonstrated on the live dog. Through the use of colored anesthetic agents and an autopsy of the dog used for demonstrating the

injections, the infiltrated areas are clearly demonstrated. This film should be of great interest to veterinarians and to veterinary students. The manner in which the subject is presented and the photography are both excellent.

This film is recommended for professional audiences only.

Meats with Approval

16 mm. Sound	Black and white; Running time 16 min.	Produced by U.S.D.A., Washington, D. C.	Rental \$2.00
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This film shows the purposes of the federal meat inspection program and how it helps to assure wholesome, clean meat for the consumer. It shows the steps of inspection, from live animal through the slaughterhouse and cannery. It tells how the meat inspection law came into being, how it is administered, and what it means to the consumer in terms of health and safety. This film is recommended for professional and lay audiences.

Nagana

16 mm. Sound	Color; Running time 20 min.	Produced by Film Services, Union Education Dept., & Vet. Res. Inst., Onderstepoort, Union of South Africa	Rental \$1.00
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Nagana is an acute or chronic infectious disease of domestic animals, characterized by anemia, loss of condition, lack of energy, remittent fever, and edema. It can be caused by one or more of the trypanosomes: *Trypanosoma congolense*, *Trypanosoma brucei*, or *Trypanosoma vivax*. The disease is spread by the tsetse fly which is the true host of these parasites.

This film shows the distribution of the disease in South Africa. It describes and shows the symptoms, the means of diagnosis, and control measures. The life cycle of the tsetse fly is shown with excellent closeup and magnified shots of the several stages of development of the insect. Methods for controlling the fly and the disease include surveys, reduction of wild game, eradicating fly-breeding areas, the use of insecticides by aircraft, and dipping solutions for animals. This is an excellent picture for teaching purposes in courses of infectious diseases and parasitology. It is recommended for professional and lay audiences.

Newcastle Disease

16 mm. Silent	Color; Running time 15 min.	Produced by P. P. Levine and Associates, Cornell University, Ithaca, N. Y.	Rental \$2.50
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By the use of excellent photography, this film illustrates both the respiratory and nervous symptoms that are associated with Newcastle disease. Along with portrayal of symptoms, a brief description of the disease is given. Although methods of prevention and control are not given, this film does provide an excellent review of the symptoms of the disease for both students and veterinary practitioners.

Outbreak

16 mm. Sound	Color; Running time 29 min.	Produced by U.S.D.A., Washington, D. C.	Rental \$3.00
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This film presents the story of foot-and-mouth disease from its earliest history to the outbreaks in the United States and Mexico. It shows what happened during the 1929 outbreak in California, and uses this occurrence to show how the disease was stopped in its tracks by the combined efforts of local, state, and federal agencies. A Mexican sequence brings the data on the disease up to 1949 and tells what the Mexican and United States governments are doing cooperatively to combat it.

The film is recommended for professional and lay audiences.

Pullorum Disease Control

16 mm. Silent	Color; Running time 10 min.	Produced by California Dept. of Agriculture, Sacramento, Calif.	Rental \$2.00
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This is an excellent film portraying the proper sanitary measures necessary to control pullorum disease in turkeys. The story from farm to hatchery is well documented. The tech-

nique for drawing blood samples and the tube-agglutination test for pullorum disease is shown. Sanitation and proper management both on farm and at hatchery are emphasized. The film should be of interest to student groups, veterinarians, and lay audiences. The photography and general presentation is good.

Scrapie

16 mm. Sound	Color; Running time 9 min.	Produced by U.S.D.A., Washington, D. C.	Rental \$2.50
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The film briefly discusses the history and geographical distribution of scrapie. It describes the etiology, the epizootiology, and the problem of control including the unusually long incubation period. The characteristic symptoms are well shown, as is the "scratch reflex" which seems to be pathognomonic of this disease. Colored photomicrographs of the histopathology show the characteristic vacuolization of the neurone upon which a confirmed diagnosis is based. Differential diagnosis is also included.

This film should be extremely helpful in providing visual information to veterinarians and veterinary students on this unusual disease of sheep.

Sheep Scab

16 mm. Silent	Color; Running time 12 min.	Produced by Kansas State College, Manhattan, Kan.	Rental \$2.50
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This film depicts the cause of sheep scab and symptoms in severely affected flocks. Pictures include the extreme loss of wool and evidence of the itching and irritation caused by the mite infestation. Treatment by dipping is depicted and the progress of treated cases following dipping and shearing is shown. There is also some good photomicrography of the mite. All of the photography is good and the subject is interestingly presented. It is of interest to graduates and students of veterinary medicine and is suitable for showing to lay audiences.

Some Uses for Gelfoam in Veterinary Surgery

16 mm. Silent	Color; Running time 35 min.	Produced by Dept. of Small Animal Surgery and Medicine, A.P.I., Auburn, Ala.	Rental \$2.50
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The use of the intramedullary pin for fracture reduction, surgical intervention in paraplegia due to herniation of the nucleus pulposus, and the enucleation of the eye are depicted in this film. The reduction of the fractures of the femur are excellently photographed and show quite clearly the technique involved. The surgical technique shown is no doubt ideal.

The pictures of the reduction of the herniation of the nucleus pulposus do not demonstrate as clearly the surgical procedure followed and are not as instructive as those of the fracture reduction.

The eye enucleation operation is clearly photographed and the technique used is easy to follow. The picture also shows how absorbable gelatin sponge (gelfoam) is used in these operations in the dry form or soaked in thrombin or penicillin or both, as well as demonstrating the surgical techniques followed.

The film is of interest to all veterinarians and to advanced students of veterinary medicine, but not to laymen.

Striking Back Against Rabies

16 mm. Sound	Black and white; Running time 12 min.	Produced by Communicable Disease Center, U.S.P.H.S., Atlanta, Ga.	Rental \$2.00
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This is the story of how Middletown controlled a serious epizootic of rabies in its dogs. Beginning with newspaper headlines and the radio commentary on the occurrence of rabies, the major portion of the picture is devoted to the procedures of the community to get the disease under control. A quarantine order is put into effect, vaccination clinics are established for dogs, and control of the stray dog is strengthened. A dog with rabies is shown, along with the procedure followed in the laboratory for the examination of the brain, as well as a photomicrograph of the Negri bodies. Veterinarians may not approve of the picture of the outdoor vaccination clinics. However, the talk given by Dr. Richards on the control and eradication of rabies will be welcomed by those who are acquainted with the problem.

The film presents a lot of well-documented information in a short time. In some instances,

a little more explanatory script and more pictures would have improved the film. However, a good job is done of presenting the story on rabies briefly and in an interesting manner.

This film is recommended for professional and lay audiences.

Teschen Disease

16 mm. Sound	Black and white; Running time 12 min.	Produced by U.S.D.A. and F.C.D.A. Washington, D.C.	Rental \$1.00
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The picture describes Teschen disease in swine and shows the symptoms produced by the virus of this infection and the various forms that the disease might present. It points at the symptoms of nutritional deficiency and unusual cases of hog cholera that might be confused with those associated with Teschen disease and suggests the differential features that should be considered in making a diagnosis.

This film is recommended for practicing veterinarians and veterinary students.

The Threat of the Cattle Fever Tick

16 mm. Sound	Color; Running time 16 min.	Produced by U.S.D.A., Washington, D.C.	Rental \$2.50
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The threat of the cattle tick *Boophilus annulatus* to the cattle industry because of its transmission of tick fever or piroplasmiasis and the success of the campaign conducted by the Bureau of Animal Industry of the U.S. Department of Agriculture in practically eradicating the tick and the disease from the United States are highlighted in this film. The importance of this eradication campaign to the development of the cattle industry in the southern part of the United States is clearly shown. Pictures of the tick, tick eggs, the hatching, and migration into vegetation are also shown. The use of dipping vats to eliminate the ticks from animals is depicted both in connection with the eradication campaign and in the import precautions employed to prevent the reintroduction of the cattle tick into the United States from which it has been eradicated except for a narrow zone along part of the Mexican border. The contribution of the discovery that ticks transmitted the disease, to the control of human diseases such as malaria and yellow fever is mentioned, as are the measures still employed along the Mexican border to prevent the spread of the disease to other parts of the United States.

The importance of eliminating the cattle tick by dipping cattle and how this practice made possible the virtual eradication of the tick and tick fever (piroplasmiasis) from the United States is shown by this film.

It is recommended for professional and lay audiences.

Tick Paralysis in Cattle and Buffalo

16 mm. Silent	Color; Running time 15 min.	Produced by Rocky Mountain Laboratory, U.S.P.H.S. Hamilton, Mont.	Rental \$2.50
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This film is a case report of the tick paralysis in cattle and buffalo. An introduction precedes the report of the outbreak on the ranch which involved 31 yearling cattle. The pictures of the male and female tick *Dermacentor andersoni* add to the introduction.

This is the first known report of the occurrence of tick paralysis in a herd of buffalo. Six of 10 yearlings were affected in less than twenty-four hours. Blood examinations revealed no infection. The only treatment was removal of the ticks, but in twenty-four hours all were again normal with the exception of 1 animal that was lame in the left hind leg.

The film is recommended for professional and lay audiences.

Today's Chicks

16 mm. Sound	Color; Running time 20 min.	Produced by U.S.D.A., Washington, D.C.	Rental \$2.50
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The purpose of this film is to show the importance of the National Poultry Improvement Plan to the production of healthy chicks and their maturing into profitable egg producers. The opening scene presents the magnitude of the poultry industry and the place the Plan occupies in it. Hatchery sanitation and management are discussed.

Although this film no doubt was designed primarily for poultry raisers, veterinarians will

find it interesting. The photography and narration are well done and the film is interesting from beginning to end.

Veterinarians not entirely familiar with the operation of the N.I.P. and R.O.P. will receive a good, brief, review of these plans. The film will also be interesting to students in schools of veterinary medicine and should familiarize them with their responsibility to the poultry industry.

Triple Threat of Brucellosis

16 mm. Sound	Color; Running time 25 min.	Produced by U.S.D.A., Washington, D.C.	Rental \$1.00
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This is an excellent film on brucellosis. Opening with scenes which realistically portray the manner in which brucellosis may be transmitted among cattle, goats, and swine from sources both near and far, this film proceeds to emphasize the economic and public health dangers of this disease and the measures which can be applied toward its effective detection, prevention, and eradication. The early history of brucellosis and the development of *Brucella* strain 19 vaccine are reviewed.

Emphasizing the public health implications of brucellosis, Alice Evans reviews the infection she suffered for some ten years, from which the film proceeds to describe the widespread human brucellosis infection which, as pointed out in the film, can be prevented only through the eradication of brucellosis within the animal populations.

This film is recommended for professional and lay audiences.

Turkey Diseases

16 mm. Silent	Color; Running time 20 min.	Produced by Dr. E. N. Moore, Cornell University, Ithaca, N.Y.	Rental \$2.50
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By the use of excellent photography and concise titles, this film presents in a most interesting manner much practical information about the diseases and conditions shown. Erysipelas, aspergillosis, infectious sinusitis, impaction of the crop, broken legs, creosote poisoning, and bursitis are ailments depicted. Each condition or disease is discussed as to the cause, laboratory procedures followed in diagnosis when applicable, symptoms, lesions on autopsy, treatment when known, and recommended control measures. The conclusion of the picture shows how the artificial insemination of turkeys can be accomplished. The photography is good and the material shown is all pertinent, and the titles sufficient.

This film should be of interest to veterinarians and to students in the last years of their professional training.

U.S.A.F. Veterinary Services

16 mm. Sound	Color; Running time 35 min.	Produced by Knickerbocker Productions, Inc. New York, N.Y.	Rental \$2.50
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This film portrays veterinary personnel participating in such military public health activities as food inspection, animal service, food service hygiene and sanitation, preventive medicine, nutrition, and research. It is of value in acquainting civilian professional organizations with the scope and variety of veterinary activities in the Air Force and their relationship to the civilian components of the profession.

All veterinarians, whether they be established practitioners, government employees, recent graduates or students, will find this film of considerable merit in orienting themselves on Air Force utilization of veterinary arts and sciences. It is recommended for professional and lay audiences.

Use of Stader Reduction Splint in Treating Fractures of Small Animals

16 mm. Silent	Black and white; Running time 10 min.	Produced by Otto Stader, Ardmore, Pa.	Rental \$2.00
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This film depicts the use of the Stader splint in the reduction of fractures of small animals. Since intramedullary pinning has largely replaced the use of this apparatus, the film is of value from a historical standpoint. It is suitable for professional audiences.

Valiant Years

16 mm. Sound	Black and white; Running time 25 min.	Produced by Associated Serum Producers Des Moines, Iowa	Rental \$2.50
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This film depicts the advances and accomplishments of the veterinary profession since the early 1900's. It is an excellent portrayal of the progress in veterinary education and research that has contributed to the welfare of the livestock industry.

The theme, photography, narration, and selection of subject matter are all excellent. This film is recommended for professional and lay audiences.

Vesicular Exanthema

16 mm. Sound	Color; Running time 16 min.	Produced by U.S.D.A. and F.C.D.A., Washington, D.C.	Rental \$2.50
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This film tells the story of the outbreak of vesicular exanthema in 1952, its rapid spread, and the control measures taken. This outbreak is used as a graphic example of the dangers of the infectious diseases to the livestock industry of the Nation.

The film shows the disease symptoms and depicts differential diagnostic field tests. It reviews federal and state cooperative efforts in disease control including herd inspection, diagnosis and quarantine, and disinfection. In the case of vesicular exanthema, the proper cooking of garbage fed to swine is an essential part of an effective control program.

It describes and pictures garbage-cooking methods and devices, recounts advantages of this preventive program, and points out that the thorough cooking of garbage fed to swine may be expected to curb the spread of other diseases such as tuberculosis, swine erysipelas, vesicular stomatitis, Newcastle disease, and even trichinosis against which the Public Health Service has led a continuing fight.

The film acknowledges the vital part played by garbage-feeders in converting a waste program to pork production, and seeks to aid them in protecting their own industry as well as the welfare of livestock throughout the country. It pays tribute to the cooperation and help of agencies of the swine industry in a program of cleaning and disinfection, and to the states that have passed legislation governing the cooking of garbage.

It does warn, however, that the campaign to control outbreaks and eradicate vesicular exanthema and similar diseases requires the "cooperation of everyone connected with livestock industry, from the producer to the consumer."

This film is recommended for professional and lay audiences.



THE NEWS

Ninety-Second Annual AVMA Convention—Minneapolis August 15-18, 1955

Wisconsin Also Welcomes Conventioners

Wisconsin's scenic beauty and colorful historic background offers "convention-goers" endless opportunities to indulge in outdoor sports in a lake-studded playground as near perfection as man has ever found. The complete story, however, is not merely that nature made Wisconsin an outdoor state. Large areas have been preserved and maintained in all their virgin beauty. State parks offer 14,000 picturesque acres for your pleasure, and state forests afford 224,000 acres of recreational playground.

Over 8,600 sparkling lakes and 8,349 miles of trout streams provide a paradise for fishermen. Proper regulation of the fish harvest, habitat, protection, and improvement are the modern tools utilized in fish-management programs to assure good fishing.

For a real thrill, tangle with a muskellunge—a fighting "tiger musky"—king of all freshwater game fish. Wisconsin is the muskellunge capital of the nation. Or test your skill on walleyes, northern pike, large-mouth or small-mouth black bass. Maybe you'd rather

"deep sea" fish for lake trout, or fly-fish rushing streams for brook, rainbow, or brown trout.

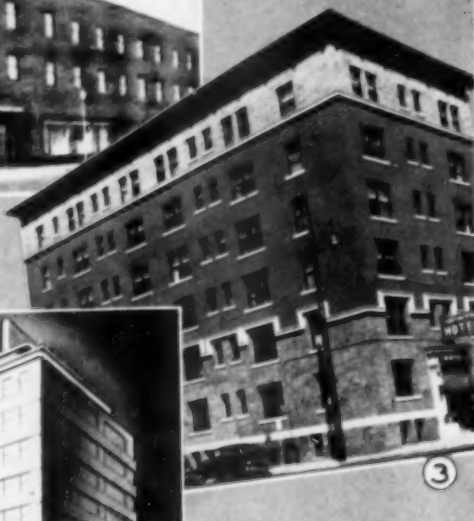
If your interest is in beautiful scenery, in relaxing travel, in outdoor sports such as swimming, golf, sailing, canoeing, or horse-back riding—Wisconsin offers "what it takes" for vacation satisfaction. You are invited to visit the lakelands region of southern Wisconsin and the scenic and historic driftless area of southwestern Wisconsin. Enjoy the Lake Michigan shore and Door County's cherryland or the scenic beauties of central Wisconsin. Try a sample of northeastern Wisconsin, the most concentrated lake region in all the world, or the historic and beautiful Apostle Islands in Lake Superior; or the famed Indian Head Country of northwestern Wisconsin. When hot weather arrives, Wisconsin is where the nights are cool.

There are hotels and motels, resorts both large

(Continued on page 335)



Vacationers enjoying one of Wisconsin's beautiful lakes.



THE NEWS

(Continued from page 333)

and small, forest lodges and lakeside cabins, modern housekeeping cottages and rooms for tourists in homes along the way.

For further information write to J. H. H. Alexander, Supervisor, Recreational Publicity, Wisconsin Conservation Department, Madison, Wis.

HOTEL RESERVATIONS

All of those planning to attend the Minneapolis session are urged to make their reservations early. Hotel information and a reservation form appear in this issue (pp. 56, 57) and will be printed in succeeding issues for several more months.

◀ Key to Hotels in Minneapolis Pictured on Opposite Page

Andrews—1; Camfield—2; Continental—3; Curtis—4; Dyckman—5; Francis Drake—6; Hampshire Arms—7; Leamington—8; Nicollet—9; Normandy—10; Sheridan—11.



A peaceful retreat—one of Wisconsin's lovely northern lakes.



A fisherman's paradise—one of the many scenic, well-stocked trout streams for which Wisconsin is famous.



News From Washington



The Federal Civil Defense Administration has recently announced publication of a technical manual which describes the responsibilities and duties of the **veterinarian in civil defense**. Following are the three principal roles listed: (1) to assist the medical profession in the treatment of casualties immediately following an attack; (2) to protect food animals against diseases and the effects of atomic, biological, and chemical warfare; (3) to inspect meat, poultry, and other foods of animal origin.

At civil defense first-aid stations, veterinarians, under a physician's supervision, will be expected to treat shock, burns, surgical casualties, and assist in the care of radiation casualties. For this work, veterinarians are urged to register for American Red Cross training courses. The booklet also states that F.C.D.A. and the American Red Cross have arranged for members of veterinary medical societies to receive instruction in first-aid methods, covering problems peculiar to disaster and serious medical emergencies. The manual, entitled, "The Veterinarian in Civil Defense" (TM-11-11), is being distributed to civil defense officials, veterinary associations, schools of veterinary medicine, and other groups. Copies may be obtained for 15 cents each from the Superintendent of Documents, Washington 25, D.C.

★ ★ ★

The percentage of **increase** for work performed in the expanded **brucellosis program** in January, 1955, as compared with September, 1954 (accelerated program did not get under way until October, 1954), is as follows: herds tested, 35 per cent; cattle tested, 77 per cent; reactors identified, 63 per cent; calves vaccinated, 26 per cent; indemnity claims received, 91 per cent; reactor indemnity paid, 147 per cent; monthly liability for indemnity, 692 per cent.

(U.S.D.A. advises that "over 400%" has previously been used in a manner which might be confused with this figure. The "over 400%" indicated the claims actually vouchered and was not related to the total indemnity for each month.) Practitioners working in this program on a fee basis during January numbered 2,313.

★ ★ ★

The Civil Service Commission recently

approved **higher entrance salaries** for GS-5 and GS-7 engineers, chemists, and a few other classes of positions. It is reported the U.S.D.A. is considering requesting the Civil Service Commission to approve an entrance salary of approximately \$400 per month for veterinarians.

★ ★ ★

Among some of the recommendations the Hoover Commission sent to the Congress on February 28, along with its Medical Task Force study, are: that a **federal health council** be established; that the Secretary of Defense with the help of the health council develop recommendations for revision of the Selective Service Act to effect maximum **utilization of medical personnel**; that the Food and Drug Administration, U.S.D.A., and the Budget Bureau review areas of overlapping and possible duplication in FDA and agricultural programs, and to determine if some services are no longer necessary.

Although the Hoover Commission report is based on its Medical Task Force study, there are some differences between the expert advisory group and the parent commission report. Copies of the Medical Task Force report may be obtained at the Government Printing Office, Washington 25, D.C., for 40 cents each. The Hoover Commission report is not yet available for general distribution.

★ ★ ★

The House Armed Services Committee as of March 8 had not set a date for hearings on HR 2886, a bill to **extend the doctor draft law** to July 1, 1957.

★ ★ ★

It is understood the Defense Department and the Budget Bureau have about completed screening of a proposed bill which would authorize the \$100 **extra monthly pay** for physicians, dentists, and veterinarians entering the military service after June, 1955.

AVMA Office Address in Washington
Brig. General James A. McCallam (Ret.)
Room 109, 1507 M Street, N.W.
Washington 5, D. C.

Special Committee on Insurance Polls Membership re Group Health and Accident Coverage

(The following letter was mailed to the AVMA membership on March 15, 1955.)

Dear Member:

In the belief that the American Veterinary Medical Association exists for the welfare of its members, we are presently giving much thought and study to a project which we feel can provide a great service to our members.

In the past several years, national professional associations such as ours have sponsored health and accident insurance plans for their members on a *true group* basis. Such plans have enabled members to obtain health and accident (disability) insurance with much more liberal coverage and benefits, and at less cost. Because of mass buying power made possible through the American Veterinary Medical Association for its membership, these broad coverages can be obtained at savings in cost, ranging from 30 per cent to 60 per cent over policies purchased on an individual basis. Moreover, a plan developed and sponsored by the Association on a *true group* basis would be free of most of the restrictions and escape clauses commonly found in individual policies.

Naturally, the success of such a plan must depend on the desire of our members to participate. We would like to know whether or not you approve further activation of this project by the American Veterinary Medical Association and its Committee on Insurance.

Enclosed is a questionnaire for you to complete and return *at once*. Your response will enable us to determine whether there is sufficient interest among our members to warrant further study.

AVMA SPECIAL COMMITTEE ON INSURANCE

O. NORLING-CHRISTENSEN, <i>Chairman</i>	
CARL A. BRANDLY	S. W. HAIGLER
HOMER D. CARTER	LEE T. RAILSBACK
G. G. GRAHAM	A. H. QUIN (<i>ex officio</i>)

Dr. Dunne, Research Fellow, in Charge of Expanding Research Program

Dr. Howard W. Dunne, the second veterinarian to be awarded an AVMA Research Fellowship, is now professor of veterinary science at Pennsylvania State University, State College, Pa. In this position, which he assumed in November, 1953, he has charge of an expanding program of veterinary research.

After receiving his D.V.M. degree at Iowa State College in 1941, Dr. Dunne practiced one year and worked for the Corn States Laboratories, Inc., for four years before commencing his AVMA research studies at Michigan State College in 1946. His studies, on the subject of swine enteritis, were interrupted in September, 1948, when he was sent by the United States Bureau

of Animal Industry to Holland for one year, then to Mexico on a research project on foot-and-mouth disease.

Dr. Dunne then returned to his graduate work at Michigan State College and received his Ph.D. degree in 1951. Much of his thesis, "A Study of



Dr. Howard W. Dunne

an Encephalitic Strain of Hog Cholera Virus," was published in the *American Journal of Veterinary Research* (July, 1952).

After completing his graduate study, Dr. Dunne served as associate professor in the Department of Bacteriology and Public Health at Michigan State College until August, 1952, when he resigned to become deputy chief of the Veterinary Microbiology Division of the Chemical Corps Biological Laboratories at Camp Detrick, Md.

In his present position, he has the responsibilities of general supervision of the research program and personal direction of the large animal research work, including diseases causing abortion in cattle, sheep, and swine; hog cholera and atrophic rhinitis of swine; calf scours; lamb pneumonia; diseases associated with fungous toxins; and poultry diseases, especially the respiratory diseases and blackhead in turkeys.

While Dr. Dunne devotes full time to investigational work, he is also a member of the graduate faculty and directs the research work of graduate students. Because of his special training, the work on the virus of hog cholera, which emphasizes the new methods of establishing variations in the virus and in animal susceptibility to the virus, is Dr. Dunne's direct responsibility.

Published articles, of which he is sole author or has collaborated with others, include "The Relation of Infarction to the Formation of Button Ulcers in Hog Cholera-Infected Pigs," *Proc. Book, AVMA* (1952); "A Note on the Use of Surital Sodium Anesthesia in Swine," *J.A.V.M.A.* (July, 1954); "A Case of Chronic Hog Cholera," *M.S.C.*

Vet. (Spring, 1954); "Hog Cholera and Other Virus Diseases of Animals," *Vet. Med.* (August, 1954).

Dr. Dume served as secretary of the Section on Research at the annual meeting at Toronto in 1953 and as chairman of that section in Seattle in 1954.

Seventh International Congress of Comparative Pathology

The Seventh International Congress of Comparative Pathology will be held at the Institut d'Anatomie Pathologique, Lausanne, Switzerland, May 26-31, 1955. The program will include, in part, formal papers and discussions on viral infections transmitted to man by animals, pathological and hygienic aspects of atmospheric pollution problems, and growth disturbances in comparative pathology including the human problem. Official languages of the Congress will be French, English, German, Italian, Spanish, and Russian. A technical exhibit will be provided and visits to scientific institutions will be made. Postcongress tours of two to five days in scenic Switzerland are planned.

Titles and texts of communications must be submitted not later than May 1, 1955, to the general secretary of the Seventh International Congress of Comparative Pathology, 19 rue César-Roux, Lausanne, Switzerland. Requests for the program and inquiries concerning registration should be addressed to the general secretary or to Lee M. Hutchins, chairman, United States Section (Chief, Division of

Forest Disease Research, Forest Service, U. S. Department of Agriculture, Washington 25, D. C.)

STUDENT CHAPTER ACTIVITIES

For copy deadline, see "Among the States and Provinces"

Illinois Chapter.—The University of Illinois Student Chapter of the AVMA elected the following officers at their January 13 meeting: Marlin D. Kleckner, president-elect; John A. Shiels, vice-president; and Vincent W. Chaffee, secretary. James S. Larsen is president of the Chapter.

Dr. Roger A. Grant, Wyoming, Ill., gave an interesting talk on problems encountered by a graduate veterinarian entering practice.

S/VINCENT W. CHAFFEE, Secretary.

Ohio Chapter.—With the holiday season past, the members of the University of Ohio Student Chapter of the AVMA have continued their enthusiastic support of the organization through good attendance and interest in the business matters and speakers.

The evening of January 19 was set aside for the participation of the College of Veterinary Medicine in the annual campus-wide Religion and Life Week. Refreshments were served following an address by the evangelist **Dr. Julian Hart**.

The annual square dance sponsored by the student auxiliary was held February 19 at Holiday Hills in Delaware. This popular event is a deviation from the usual entertainment.

The proposed bylaws of the student council for the College of Veterinary Medicine have been accepted by all classes and regular council meetings are being held. The council members selected by the student body are: Harold Butcher and Rex Nash, freshmen; Ralph Storts and Gordon Johnson, sophomores; Harrison Gardner and Harold Davis, juniors; and Max Joseph and Dick Rainier, seniors. Max Joseph is chairman and Ralph Storts is secretary.

As arranged and approved by a student committee and executive college board, the Veterinarian's Oath will be taken by the graduating seniors at a banquet during the spring commencement with the faculty and immediate families attending.

On February 16, **Dr. V. L. Tharp**, director of the Ohio State University veterinary clinics, was moderator of a question-and-answer panel.

S/W. HAROLD DAVIS, Secretary.

Ontario Chapter.—At the January 12 meeting of the Ontario Veterinary College Student Chapter of the AVMA, **Dr. Floyd Cross**, dean of the School of Veterinary Medicine, Colorado A. & M. College, and president of the AVMA, gave an address on duties to the pro-



Dr. William G. Magrane (right), Mishawaka, Ind., receives his "Fido" (dogdom's equivalent of Hollywood's Oscar) as veterinarian of the year from Harry Miller, director of the Gaines Dog Research Center, at ceremonies held in New York in connection with the great Westminster dog show. Dr. Magrane was voted the honor in a nation-wide poll conducted by the Center, for his outstanding research work on canine ocular infections and surgery and highly informative talks before veterinary groups around the country.

fession and to organized veterinary medicine of graduate veterinarians. **Dr. R. McG. Archibald**, president of the Canadian Veterinary Association, further emphasized this and extended greetings on behalf of his Association.

The first meeting of the current school



Left to right—Principal T. L. Jones; Dr. R. McG. Archibald, president of the Canadian Veterinary Association; H. C. Gibbs, president of the Student Chapter; and Dr. Floyd Cross, president of the AVMA.

session featured an interesting talk by **Dr. W. J. R. Fowler**, professor emeritus, who related some of his experiences during fifty-six years of association with horses and horse men.

At the next meeting, films on wildlife were shown. **Dr. Frank Milne**, professor of surgery, was the guest speaker at the December meeting. He told anecdotes from his tour of duty in Burma and India during World War II. The January 28 meeting was the annual "At Home" banquet.

S/HAROLD C. GIBBS, President.

WOMEN'S AUXILIARY

President's Message.—I am happy to extend greetings to the members of the Women's Auxiliary to the American Veterinary Medical Association. It has been a wonderful privilege to be your president, one which has made me proud and yet humble. It is a tremendous responsibility to be the official representative of over 4,000 women and to do it in such a way that brings only credit to our organization.

The compensation for being president is the privilege afforded me of meeting many of you at your own state or regional meetings. I have had the pleasure of attending the auxiliary meetings of the Pennsylvania, West Virginia, Ohio, Indiana, Iowa, and Illinois Veterinary Medical Associations. The women from Cuyahoga County (Ohio) invited me to help them at an organization meeting, which I was delighted to

do. They are making preparations to be the hostess group when the AVMA meets in Cleveland, Ohio, in 1957. At this time, I have an invitation to be the guest of the Kentucky Auxiliary at their meeting in July.

It has been brought to my attention that all auxiliaries are not aware that if an invitation is issued to the president, there is a possibility of having her attend their state or regional meeting. Of course, our travel allowance is small, but as many invitations are accepted to be the guest of affiliated auxiliaries as can be covered by the budget.

The personal contacts have been delightful and the many courtesies shown me are heart-warming and have been much appreciated.

We had such a stimulating meeting in Seattle. I wish that each one of you might have been there, but I feel sure that your representatives have shared with you the reports of our activities and the entertainment that we enjoyed.

A big stride has been made in membership, now over 4,000, but we have a long way to go to reach our potential—that is the same number of members as belong to the AVMA.

Apropos of membership, an amendment made in our bylaws in 1953 (article VI, section 1) became effective Jan. 1, 1955. This makes the dues year coincide with the calendar year. New members will pay a membership fee of \$1.00 in addition to the annual dues of \$1.00, a total of \$2.00. Present members will continue to pay annual dues of \$1.00.

I believe that we all share the same desire, to help our husbands and advance the standing of their profession, and that the best way to do this is to become a member of the Women's Auxiliary to the AVMA. The dues are our only source of income, so it is only by increased membership that we can continue and expand our projects.

However, increased membership has created a problem. The work of some of the offices, particularly that of membership secretary, has become so heavy that it will soon be past that of a part-time position. The officials of the AVMA tell us that we are now, membership-wise, in the same situation as the AVMA was when it had to decide on a full-time executive secretary. That step would incur such an increased budget that it is out of the realm of possibility with our present dues structure. It is a problem that will require action before too long, so I recommend it for your thoughtful consideration. Nevertheless, even the problem is an inspiration, for we have doubled our membership in the last three years!

It is rewarding to have the evidence of your interest and cooperation in the projects of the Women's Auxiliary. Substantial contributions have been received from affiliated auxiliaries for the Student Loan Fund and the AVMA Research Fund. These contributions, the tremen-

dous growth in membership, and your evinced interest in the annual meetings all help to make our Women's Auxiliary the vital and forward-looking adjunct to the AVMA that it was meant to be, and which should always be our goal. While we work together, we find that we are making valued friendships with women of like interests from all over North America.

So I urge you to plan to come to Minneapolis, August 15-18, and hope that I will have the pleasure of seeing you there.

s/MRS. L. R. RICHARDSON, *President*.

Intermountain Auxiliary.—The annual meeting of the Women's Auxiliary to the Intermountain Veterinary Medical Association was held at the Hotel Utah in Salt Lake City on Jan. 17-19, 1955. Wives of more than 50 veterinarians from eight western states were registered.

Following registration the first morning, activities opened with a noon luncheon on the Roof Garden of the Hotel Utah, with Mrs. Jean C. Flint and Mrs. F. H. Melvin, both of Salt Lake City, as co-chairmen. Mr. Jack Carlson, president of the student body of the University of Utah, and his attractive wife told of their experiences in Europe, including eastern Germany, during a trip last summer. Bridge was enjoyed following the luncheon.

The evening meeting included election of officers and reports on the meeting of the Women's Auxiliary to the AVMA last August in Seattle by Mrs. R. W. Gold of Salt Lake City, who was elected recorder of the AVMA Auxiliary.

The annual birthday luncheon was held on February 18 at the Hotel Utah. Mrs. C. L.

Jones and Mrs. Grant Boam of Salt Lake City were co-chairmen. This was followed by a trip through the "Home Living Center" at the University of Utah, with Mrs. E. A. Tugaw as chairman. The annual dinner-dance of the Intermountain V.M.A. was held that evening on the Roof Garden.

Auxiliary activities were concluded with a "brunch" the next morning. Officers for the coming year are: Mrs. Jean C. Flint, Salt Lake City, Utah, president; Mrs. George N. Glover, Torrington, president-elect; Mrs. A. W. Elting, Miles City, Mont., vice-president; and Mrs. H. M. Marlowe, Salt Lake City, Utah, secretary-treasurer.

s/MRS. H. M. MARLOWE, *Secretary*.

Iowa Auxiliary.—The three-day program of the women's Auxiliary to the Iowa Veterinary Medical Association began with a tea and reception for the president, Mrs. C. L. Nelson of Jewell. A luncheon, style show at Younkers, and a banquet were also scheduled social entertainment; the final feature being a brunch on Thursday morning with United Airlines presenting a film on Hawaii.

Mrs. L. R. Richardson, Ravenna, Ohio, president of the Women's Auxiliary to the AVMA, and Mrs. C. M. Rodgers, Blandinsville, Ohio, AVMA Auxiliary membership secretary, attended as guests.

The newly elected officers are: Mrs. F. C. Kochendorfer, Decorah, president; Mrs. J. K. Dewar, Cherokee, president-elect; Mrs. E. J. Osen, Anita, vice-president; and Mrs. L. R. Edrington, Creston, treasurer.

s/MRS. R. A. LEEPER, *Publicity Chairman*.

Kansas Auxiliary.—The Women's Auxiliary to the Kansas Veterinary Medical Association held its twenty-first annual meeting at the Town House Hotel in Kansas City, Kan., in conjunction with the fifty-first annual meeting of the Kansas Veterinary Medical Association on Jan. 6-8, 1955. There were 55 Auxiliary members and 21 guests registered.

The annual business meeting, held following the brunch on January 7, was presided over by the vice-president, Mrs. T. J. Leasure. The following officers were elected to serve during 1955: Mrs. A. W. Brecheisen, Garnett, president; Mrs. R. E. Bogue, Wichita, vice-president; Mrs. J. A. Porter, Jr., Fredonia, secretary-treasurer; and Mrs. E. L. Boley, Wichita, historian. Mrs. Boley has served in this capacity since the organization of the Auxiliary.

At the brunch, Mrs. L. J. Miller, deputy president of the Illinois Auxiliary, spoke on that group's public relations program. A committee was appointed to study this program with the view of adopting it in Kansas.

At the luncheon on January 8, Mrs. Kenneth Carbaugh, wife of a local physician, gave a delightful review of the book, "Leave It to Miss



Officers of the Women's Auxiliary to the Intermountain Veterinary Medical Association. Left to right—Mrs. H. M. Marlowe, Salt Lake City, secretary-treasurer; Mrs. George N. Glover, Torrington, Wyo., president-elect; Mrs. Jean C. Flint, Salt Lake City, president; and Mrs. A. W. Elting, Miles City, Mont., vice-president.

Annie" by George Tucker Smith, which was greatly enjoyed by all present.

The Auxiliary activities were concluded with a drawing for prizes contributed by the state Association.

The committee on local arrangements was headed by Mrs. K. M. Curtis with Mrs. Busch Meredith as co-chairman. Other members were: Mesdames F. B. Ogilvie, R. L. Messer, and R. J. Milleret, of Kansas City; W. J. Gough, Mission; G. B. Smith, Merriam; and H. W. Young, Overland Park.

S/MRS. J. A. PORTER, *Secretary*.

Kansas State Student Auxiliary.—In the Women's Auxiliary to the K.S.C. Student Chapter annual talent show, each class presented a vaudeville skit. The husbands and faculty were invited.

The family Christmas party was held December 10 with the traditional Santa Claus, tree, and carols. Couples who have no children entertained neighbor children.

Dr. Vernon D. Foltz, acting head of the bacteriology department, addressed the group at the January meeting. He discussed the assistance that wives could give to their husbands as veterinarians.

On February 2, Dr. E. J. Frick, head of surgery and medicine, showed colored slides with a running commentary of his trip to Alaska last summer. Faculty wives were in charge of the program and refreshments.

Five meetings of the interest group composed of practitioner's wives have been held this year. Lieutenant Colonel G. W. Vacura discussed the duties of veterinarians in the Army, with illustrations, at the November meeting.

Mrs. Opal Hill, Kansas State College professor, presented ideas on interior decoration in December. A physician's wife, Mrs. K. F. Bascom, spoke on the obligations of a professional man's wife in the community at the January meeting.

Mrs. Dietrich, wife of Dr. M. Dietrich, Jr., of Emporia, Kan., described their bookkeeping system and some of the ins and outs of income tax returns at the February meeting.

A home economics teacher, Mrs. Vivian Johnson, discussed, at the March meeting, the preparation of meals, especially those that would fit into a doctor's nonscheduled life.

S/SHIRLEY SAMUELSON and
NANCY BECHEISEN, *Reporters*.

Michiana Auxiliary.—At the February 10 meeting of the Women's Auxiliary to the Michiana Veterinary Medical Association in South Bend, Ind., the following officers were elected: Mrs. Evelyn Holm, LaPorte, president; Mrs. Emma Magrane, Mishawaka, vice-president; Mrs. Elaine Ramsay, LaPorte, secretary; and Mrs. Ruth Williamson, South Bend, treas-

urer. During the evening those in attendance enjoyed home movies.

New Jersey Auxiliary.—The annual meeting of the Women's Auxiliary to the Veterinary Medical Association of New Jersey met following a luncheon at the Hotel Essex House, Newark, on Feb. 3, 1955. The following officers were elected for 1955-1957: Mrs. Russell S. Edmonds, Princeton, president; Mrs. O. K. Fox, Mount Holly, first vice-president; Mrs. Lester Barto, Basking Ridge, second vice-president; Mrs. A. F. North, Jr., Somerville, secretary; and Mrs. J. B. Engle, Short Hills, treasurer.

The organization voted to send \$35 to the Senior Student Loan Fund and \$25 to the AVMA Research Fund. Mrs. Oscar Sussman, Princeton, was appointed delegate to the Auxiliary house of representatives for the 1955 convention to be held in Minneapolis.

Mrs. Cele Williams Byock of Newark was the guest speaker at the luncheon. Her topic was "Furniture Periods and Style and Color Decorating."

S/(MRS. A. F.) JANE E. NORTH, *Secretary*.

Ontario Auxiliary.—The Women's Auxiliary to the Ontario Veterinary Association held its tenth annual meeting in the King Edward Hotel, Toronto, on Jan. 14, 1955. At the business meeting, presided over by President Mrs. Hawke, it was voted that we donate \$200 to the Canada Veterinary Medical Association Student Loan Fund. It was also voted that we donate \$100 to the AVMA Student Loan Fund and \$50 to the AVMA Research Fund. Mrs. R. Gwatkin reported on the meeting of the AVMA Auxiliary house of representatives in Seattle, and Mrs. R. H. Wright spoke on some of the highlights of the convention. In the absence of Mrs. A. E. Lewis, delegate to the C.V.M.A. convention in Ottawa, the report was read by Mrs. J. C. Dancy. Mrs. W. G. Stevenson was elected delegate to the AVMA annual meeting in Minneapolis, Aug. 15-18, 1955, and Mrs. Johnston was elected delegate to the C.V.M.A. convention in Saskatoon.

Events planned for the women consisted of pictures shown by Dr. E. R. Bowness, a tour of the Laura Secord factory, luncheon, and coffee.

The following officers were elected for the ensuing year: Mrs. T. W. Hawke, Cobourg, president; Mrs. R. H. Wright, Dundas, first vice-president; Mrs. W. G. Stevenson, Guelph, second vice-president; Mrs. J. C. Dancy, Aylmer, secretary; and Mrs. S. T. Bodendistel, Guelph, treasurer.

S/(MRS. J. C.) LEONE DANCEY, *Secretary*.

South Carolina Auxiliary.—The Women's Auxiliary to the South Carolina Veterinary

Medical Association met at the Jefferson Hotel, Columbia, on Jan. 22, 1955, with 37 members present and two visitors. Mrs. Otto Strock of Charleston presided in the absence of our president.

Following a discussion on our contributions to the loan fund, handled by the Women's Auxiliary to the AVMA, and also our donations to the libraries at the University of Georgia and Alabama Polytechnic Institute, it was moved that we send \$25 to the Student Loan Fund and \$10 to each of the libraries and to the AVMA Research Fund.

A letter of resignation from our president, Mrs. R. L. Willis, was read. The meeting was turned over to Mrs. J. H. Moore, chairman of the nominating committee, and the following officers were elected: Mrs. Otto M. Strock, Charleston, president; Mrs. G. K. Smith, Spartanburg, vice-president; Mrs. H. L. Sutherland, Union, secretary; and Mrs. L. C. Merritt, treasurer.

Mrs. M. R. Blackstock was elected delegate to the Auxiliary house of representatives, with Mrs. B. C. McLean as alternate.

S/SARA M. SUTHERLAND, *Secretary*.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of Feb. 18, 1955.

NEW APPOINTMENTS

August L. Antons, Los Angeles, Calif.
Bohdan Czechut, Omaha, Neb.
Angus W. Gaskin, Jacksonville, Fla.
John Krupsky, Springfield, Mass.
Jonas Narbutas, Milwaukee, Wis.
Algirdas Sova, South St. Joseph, Mo.
Donald Tolley, Denver, Colo.
Joseph S. Wheatley, Nashville, Tenn.

NAME CHANGE

Josef Ilkiw, to Joseph Ilkiw, Chicago, Ill.

MILITARY FURLOUGHS

Frederick J. Burke, St. Louis, Mo.
Charles E. Francis, Lincoln, Neb.
Billy Y. Parker, Fort Worth, Texas.
Frank A. Ramsey, Fort Worth, Texas.

RESIGNATIONS

William P. Childs, Milwaukee, Wis.
Mervin S. Corwin, Newark, N. J.
Edgar D. McMurtry, San Antonio, Texas.
Anthony E. Raimonde, Phoenix, Ariz.
Alan Smith, Beltsville, Md.
Max B. Smith, Phoenix, Ariz.
Arthur M. Strohbehn, Omaha, Neb.
Rodney C. Walker, Denver, Colo.

RETIREMENTS

William I. Bowersox, Cheyenne, Wyo.
Joseph S. Clark, St. Joseph, Mo.
Ernest E. Flory, Pierre, S. Dak.
Ward T. Huffman, Salt Lake City, Utah.
Harry E. Kemper, Albuquerque, N. M.
Myron V. Springstun, Richmond, Va.
Frank C. Swaney, South St. Joseph, Mo.

TRANSFERS

Edward R. Betlach, from Portland, Ore., to Cheyenne, Wyo.
Ormond J. Jummon, from Baltimore, Md., to Washington, D. C.
Mahlon B. Huffman, from Raleigh, N. Car., to Jefferson City, Mo.
Orello F. Hunter, from Mexico City, Mex., to St. Louis, Mo.
Clifton A. Miles, from Charleston, W. Va., to St. Paul, Minn.
Lloyd N. Miller, from Baton Rouge, La., to Phoenix, Ariz.
H. Verne Wiser, from Albuquerque, N. M., to Salt Lake City, Utah.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

AUSTIN, WILLIAM E.
Jarvis, Ont.
D.V.M., Ontario Veterinary College, 1954.

BERGMAN, ROY E.
515 E. State St., Cassopolis, Mich.
D.V.M., Michigan State College, 1921.

EXTROM, STUART R.
2711 Ione St., Sacramento, Calif.
D.V.M., Colorado A. & M. College, 1945.

FRIEDMAN, STUART S.
P. O. Box 85, Fuquay Springs, N. Car.
D.V.M., Middlesex University, 1945.

GOBER, HAROLD S.
5400 Park Heights Ave., Baltimore, Md.
D.V.M., Alabama Polytechnic Institute, 1940.

JENKINS, DEE R.
P. O. Box 1226, Amarillo, Texas.
D.V.M., Texas A. & M. College, 1949.

JONES, WILLIAM G.
400 Pembina Highway, Winnipeg, Man.
D.V.M., Ontario Veterinary College, 1949.

KITZMAN, LOUIS M.
13347 Sherman Way, No. Hollywood, Calif.
D.V.M., Michigan State College, 1949.

RABSTEIN, LOUISE S.
Frederick, Md.
D.V.M., Kansas State College, 1934.

RIFFLE, RAY C.
New Hampton, Iowa.
M.D.C., Chicago Veterinary College, 1911.

SALTER, JOHN W.
353 E. Lee St., Dawson, Ga.
D.V.M., McKillip Veterinary College, 1913.

SAUNDERS, JAMES R.
Earl Grey, Sask.
D.V.M., Ontario Veterinary College, 1954.

SMITH, SYDNEY M.

4040 El Camino Real, Palo Alto, Calif.
D.V.M., State College of Washington, 1939.

SOUTH, PETER J.

Salmon, Idaho.
D.V.M., Ontario Veterinary College, 1943.

VINSON, BRYANT C.

3015 Greenmount Ave., Baltimore, Md.
D.V.M., Alabama Polytechnic Institute, 1930.

WELSH, WILLIAM E.

Box 37, Buffalo, Minn.
D.V.M., Iowa State College, 1927.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorers.

First Listing

SULLIVAN, JOHN P.
2257 Scudder, St. Paul, Minn.
D.V.M., Colorado A. & M. College, 1953.
Vouchers: A. F. Sellers and A. F. Weber.

Second Listing

VENUS, MARCELINA B., 348-D P. Campa St., Sampaloc, Manila, P.I.

1954 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from the 1954 senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

University of California

OLIVER, JOHN W., D.V.M.
1172 Minnesota Ave., San Jose, Calif.
Vouchers: G. A. Linton and J. E. Craig.

University of Illinois

STROMBECK, DONALD R.
80th Medical Detachment, APO 800, New York, N. Y.
D.V.M., University of Illinois, 1954.
Vouchers: W. E. Zuschlag and V. A. Tomayko.

Texas A. & M. College

HULL, RICHARD A., D.V.M.
Box 335, Mabank, Texas.
Vouchers: H. E. Redmond and R. J. Beamer.

Second Listing

University of California

MURDOCK, MATTHEW L., D.V.M., 7145 Arlington Ave., Arlington, Calif.
SCHLINGMAN, HERMAN C., D.V.M., 2520½ 11th, Baker, Ore.

Colorado A. & M. College

HARVEY, JACK G., D.V.M., 249 S. Cottage, Salem, Ore.

Ohio State College

LEGE, MATTHEW E., D.V.M., 1515 Oleander Drive, Bartow, Fla.

Ontario Veterinary College

HARRISON, KEITH B., D.V.M., Box 40, Plainfield, Ont.

Texas A. & M. College

JONES, HOWARD H., JR., D.V.M., 403 E. Long St., Stephenville, Texas.
OGDEN, DONALD I., D.V.M., Palestine Veterinary Hospital, Palestine, Texas.

Tuskegee Institute

WHITE, JOHN H., JR., D.V.M., Box 538, Tuskegee Institute, Ala.

AMONG THE STATES AND PROVINCES

The deadline for news copy is the 24th of the month, two months preceding the month of issue

California

Bay Counties Association.—The new officers of the Bay Counties Veterinary Medical Association are: Drs. George W. Eberhart, El Cerrito, president; C. Edward Taylor, San Mateo, vice-president; and Emmet W. Paul, Redwood City, secretary. This Association meets on the second Tuesday of each month.

s/GEORGE W. EBERHART, *President*.

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Central Association.—The Central California Veterinary Medical Association met at the Tagus Ranch near Tulare on February 22. The guest speakers were Dr. LeRoy Schafer and Mr. L. J. Hoyt of North Hollywood who discussed business management in veterinary practice. Dr. William J. Zontine, president of the state Association, also addressed the group.

s/HERBERT N. PIPER, *Secretary*.

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San Fernando Valley Association.—The new officers of the San Fernando Valley Veterinary Medical Association are: Drs. Richard Hawes, North Hollywood, president; Howard C. Taylor, Burbank, vice-president; and R. A. Button, Van Nuys, secretary-treasurer. This Association meets at Eaton's Restaurant in Studio City the second Friday of each month.

s/R. A. BUTTON, *Secretary*.

Colorado

Dr. Lamb Elected to State House of Representatives.—On Nov. 2, 1954, Dr. P. Cecil Lamb, Brush, was elected to a two-year term in the Colorado State House of Representatives, representing Morgan County. Prior to this



Dr. P. Cecil Lamb

election, he had served a previous term as a member of the House and, with Dr. Norman J. Miller, was instrumental in securing passage of the revised veterinary practice act in the previous legislature. Dr. Lamb has long been active in civic affairs and professional groups.

S/R. K. ANDERSON, *Resident Secretary*.

Northern Society.—The Northern Colorado Veterinary Medical Society meets on the second Monday of each month at various cities within its boundaries. The membership totals 48 and includes practitioners and faculty members of the School of Veterinary Medicine, Colorado A. & M. College. The new officers, all of Fort Collins, are: Drs. O. R. Adams, president; Frank Scott, president-elect; and William H. Beckenhauer, secretary-treasurer.

S/WILLIAM H. BECKENHAUER, *Secretary*.

Connecticut

State Association.—The annual meeting of the Connecticut Veterinary Medical Association was held in Hartford, Conn., at the Hotel Bond, on Feb. 2, 1955. The following veterinarians were elected to office: Drs. A. I. Stern, Waterbury, president; Joseph DeVita, New Haven, first vice-president; A. R. McDonald, Bloomfield, second vice-president; and E. H. Patchen, Milford, secretary-treasurer.

The program, which was arranged by Dr. N. W. Pieper, included a discussion of small animal surgery by Dr. James Archibald, Ontario Veterinary College, Guelph; and disease detection, prevention, control, and eradication, by Dr. C. D. Van Houweling, director of live-

stock regulatory programs, U.S.D.A., Agricultural Research Service, Washington, D. C.

The program for the November, 1954, meeting, which was also held in Hartford, included a discussion of small animal surgery by Dr. C. L. Blakely, Angell Memorial Animal Hospital, Boston; and a talk on the Plum Island Animal Disease Laboratory by Dr. Maurice Shahan, of Greenport, Long Island, N. Y.

S/E. H. PATCHEN, *Executive Secretary*.

District of Columbia

Death of Dr. D. I. Skidmore.—Dr. Don I. Skidmore (OSU '04) long-time employee of the former federal Bureau of Animal Industry, and in charge of the division of Virus-Serum Control from its establishment in 1920 until he retired in 1949, died on Feb. 28, 1955, at the age of 73.

Born in West Mansfield, Ohio, Oct. 25, 1881, Dr. Skidmore entered federal service as a meat inspector the year after he received his degree in veterinary medicine. He had various assignments in BAI work in several states prior to taking up his duties in virus-serum control.

He was a member of the District of Columbia V.M.A. and the AVMA (1919-1950) and served as a member of the latter's Committee on Veterinary Biological Products from 1943 until he retired.

Surviving are his widow, Mrs. Virginia M. Skidmore, a daughter, and four grandchildren.

Illinois

State Association.—The seventy-third annual convention of the Illinois State Veterinary Medical Association was held Feb. 14-16, 1955, at the LaSalle Hotel, Chicago, with a total registration of 639, including 143 women.

The program presented at three general sessions and two sectional meetings included presentations from a number of Illinois veterinarians and the following out-of-state speakers: Drs. A. H. Quin, president of the AVMA, Kansas City, Mo.; C. D. Van Houweling, U. S. Department of Agriculture, Washington, D.C.; Robert B. McClelland, Buffalo, N. Y.; J. F. Bullard, Department of Veterinary Science, Purdue University, Lafayette, Ind.; Julius J. Fischler, Elkhart, Ind.; and George R. Burch, Pitman-Moore Research Farm, New Augusta, Ind.

On Tuesday, February 15 at 12:30 p.m., radio station WLS broadcast the dinnerbell program, conducted by Maynard Bertsch, from the convention floor, where Mr. Bertsch interviewed Drs. A. H. Quin; N. H. Howlett, Springfield; P. J. Meginnis, Roselle; H. P. Hoskins, Evanston; and A. G. Misener, Chicago.

The new officers are: Drs. A. G. Misener, Chicago, president; C. M. Rodgers, Blandinsville, president-elect; C. C. Morrill, Urbana, past-president; T. M. Wise, Effingham, treas-

urer; C. B. Hostetler, Des Plaines, executive secretary.

Members of the executive board are: Drs. A. E. Bott, Belleville, chairman; W. J. Angerer, Atkinson; J. K. Bone, Chicago; J. R. Brown, Ottawa; A. E. Dickerson, Springfield; W. G. Raudabaugh, Piper City; and H. P. Wessels, Geneva.

s/C. B. HOSTETLER, *Resident Secretary*.

Indiana

Central Association.—The new officers of the Central Indiana Veterinary Medical Association are: Drs. R. J. Hoskins, Indianapolis, president; George Burch, New Augusta, vice-president; and Charles J. York, Indianapolis, secretary-treasurer.

s/CHARLES J. YORK, *Secretary*.

Michiana Association.—The monthly meeting of the Michiana Veterinary Medical Association was held on Jan. 6, 1955, at the Hotel LaSalle, South Bend. Following a short business meeting, the women's auxiliary joined the group on a trip through the South Bend Medical Foundation, which was both interesting and beneficial to all.

At the February 10 meeting, the following officers were elected: Drs. Donald Ramsay, LaPorte, president; Julius Fishler, Elkhart, president-elect; Bruce Hostraw, South Bend, vice-president; and L. D. Ramsay, LaPorte, secretary-treasurer.

Guest speakers at the February meeting were Drs. E. S. Weisner, Goshen, 1954 president of the state Association, and Mark Davenport, Armour Laboratories, Chicago, who discussed hormones.

s/PAUL W. HOUGH, *Retiring Secretary*.

s/L. D. RAMSAY, *Secretary*.

Northeastern Association.—The Northeastern Indiana Veterinary Medical Association met in Decatur on Feb. 15, 1955. The program consisted of a panel discussion on practical experiences in veterinary medicine and a discussion on prices charged in the area. Officers of the Association are: Drs. R. E. Allison, Decatur, president; Ervin Blume, Butler, vice-president; and L. A. Shepherd, Kendallville, secretary-treasurer.

The women were entertained at the home of Mrs. R. E. Allison and heard Mrs. Jay Thacker speak on her experiences while visiting the United Nations in New York.

s/J. L. KIXMILLER, *Resident Secretary*.

Tenth District Association.—The February 17 meeting of the Tenth District (Ind.) Veterinary Medical Association was held in Richmond. Dr. Dyer C. Wood of Greensburg spoke on soil and animal nutrition as it is associated with milk fever, acetonemia, and sterility.

The following officers were elected: F. O. Gossett, Greenfield, president; R. S. Ensign, New Castle, vice-president; and Wayne Sharp, Union City, secretary-treasurer.

The women were entertained at the country club by Mrs. R. E. Miller.

s/J. L. KIXMILLER, *Resident Secretary*.

Wabash Valley Association.—The bimonthly meeting of the Wabash Valley Veterinary Medical Association was held in Peru, Feb. 16, 1955. A panel discussion had been planned, but other discussion took up so much of the time that the panel was postponed.

Officers of this Association are Drs. H. A. Stevens, North Manchester, president; P. C. Clinger, Rochester, vice-president; and R. D. Matchett, Converse, secretary-treasurer.

The women were entertained by Mrs. Klotz and Mrs. Richards of Peru.

s/J. L. KIXMILLER, *Resident Secretary*.

Iowa

State Association.—The annual meeting of the Iowa Veterinary Medical Association was held at the Hotel Fort Des Moines in Des Moines on Jan. 18-20, 1955. There were 635 men and 252 women registered for this meeting and the annual meeting of the Women's Auxiliary held in connection with it. More than 400 attended the banquet and floor show on Wednesday evening. During the business meeting, 75 applicants were accepted as members, bringing the total membership of this Association to 784.

The following speakers comprised the program: Drs. D. L. Baker, Iowa State College, Ames; Vern Bolin (Ph.D.), virologist, Jensen-Salsbery Laboratories, Kansas City, Mo.; W. E. Bowstead, Lowden; C. W. Brown, veterinarian in charge, Agriculture Research Service, Des Moines; F. E. Brutsman, Traer; D. L. Cotton, Beresford, S. Dak.; J. R. Dinsmore, Glenview, Ill.; E. R. Frank, Kansas State College, Manhattan; H. U. Garrett, state veterinarian, Des Moines; Robert Getty, Iowa State College, Ames; O. L. Haight, Cresco; R. E. Hall, county extension director, Manchester; E. H. Jones, attorney for Iowa Veterinary Medical Association, Des Moines; W. E. Kilpatrick, Mediapolis; J. H. Krichel, Keokuk, president, Iowa Veterinary Medical Association; R. L. Leeper, Des Moines; W. Q. Nelson, Inwood; A. M. Orum, Carthage, Ill.; A. H. Quin, Kansas City, Mo., president of the AVMA; W. F. Riley, Jr., Michigan State College, East Lansing, Mich.; W. H. Riser, Skokie, Ill.; R. R. Rognes, Holstein; Ben Shambaugh, Jr., Burlington, Kan.; F. S. Sharp, Ute; J. D. Shoeman, Atlantic; D. S. Steele, Minneapolis, Minn.; C. D. Van Houweling, director, Livestock Regulatory Programs, Agriculture Research Service, U.S.D.A., Washington, D. C.; R. L. West, state veteri-

narian, St. Paul, Minn.; and F. B. Young, Waukegan.

s/F. B. YOUNG, *Executive Secretary.*

The Isaac E. Hayes Memorial Fund.—Immediately following the sudden death of Dr. I. E. ("Ike") Hayes on January 25, a group of his business friends at Waterloo established a memorial fund which would provide aid for deserving veterinary students. It will be set up as part of, and donations should be sent to, the Iowa State College Alumni Achievement Fund, Memorial Union, Ames, Iowa, where they will be specified for the "Isaac E. Hayes Memorial Fund."

The first \$1,000 check for the fund was presented to Mrs. Hayes by Joe Dumond, president of radio station KXEL, on February 12. Dr. Hayes had taken care of Mr. Dumond's champion Tennessee Walking Horses. In the many tributes to Ike, he was referred to as an "immortal" athlete who did research and studied every night; a "ferocious bulldog" who could weep at the loss of an animal under his care; a man who spoke the language of animals; and a man with a tremendous appetite for not drinking and smoking.

Ike was a rare person and a fund to exemplify his enthusiasm and to perpetuate his generosity is truly a fitting memorial to him.



Dean Emeritus (and Mrs.) Chas. Murray of Iowa State College are shown at their new home in Santa Fe, N. M. (Route 3, Box 9), on a 7,000-ft peak from which they can see distant mountain ranges from every window. The scenes include Los Alamos, the atomic station, 30 miles to the west. They report that a welcome 7-inch snow decorated their pine trees on January 17. They left Ames in June and spent their thirty-ninth consecutive summer vacation at their cottage at Hackensack, Minn., before going south.

Kansas

Life Memberships in K.V.M.A.—At the fifty-first annual convention of the Kansas Veterinary Medical Association on Jan. 6-8, 1955, the following long-time members were elected to life membership in the Association: Drs. J. Lee Alder, Athol; Forrest B. Croll, Kansas City; J. I. Kirkpatrick, Sedgwick; Gustav H. Mydland, Ogdensburg; J. Armer Porter, Sr., Fredonia; John W. Smith, Lebo; and Edwin H. Steele, Neodesha.

s/K. MAYNARD CURTS, *Resident Secretary.*

Dr. Ogilvie Elected Chairman of Interprofessional Council.—Another recognition of our profession was afforded on Jan. 30, 1955, when Dr. Fred B. Ogilvie, of Kansas City, was elected chairman of the Kansas Interprofessional Advisory Council for 1955, succeeding Clarence H. Benage, M.D., of Pittsburg, Kan., who had served in that capacity since the founding of the Council in 1951.

The objectives of the Council are "to improve the total health service for the people of Kansas; to promote closer coordination among the major health service professions . . . to seek the active cooperation of its member organizations . . . to study health legislation and make recommendations to the participating associations for support of measures for improving the public health; to create a better understanding of health problems and services for all citizens."

The membership consists of two voting delegates selected from the membership of each participating association. In addition, each participating association may select nonvoting representatives as desired. The participating associations are: the Kansas Hospital Association, Medical Society, Pharmaceutical Association, State Dental Association, State Nurses Association, and Veterinary Medical Association.

The present delegates to the Council from the K.V.M.A. are Dr. Fred B. Ogilvie, the permanent representative, and the president of the K.V.M.A. during his term as president (1955, Marvin J. Twiehaus). The secretary-treasurer of the Association (K. M. Curtis) is at present our only nonvoting representative.

s/K. MAYNARD CURTS, *Resident Secretary.*

The New Veterinary Hospital at Kansas State College.—The equipment and furniture of the old veterinary hospital has been moved into the new hospital at the School of Veterinary Medicine, Kansas State College. The new building was expected to be ready for use by the beginning of the second semester early in February. Dr. E. E. Leasure stated that the dedication of the \$575,000 structure will probably be in connection with the observance of the school's fiftieth anniversary late this spring.

The hospital is designed specifically for teaching all phases of clinical medicine of live-



The new veterinary hospital at Kansas State College, Manhattan.

stock, poultry, and small animals. It contains one of the finest autopsy rooms in the country, larger x-ray room facilities, improved clinical pathology facilities, a special room for preparation of food for small animal diets, and a two-way intercommunication system.

It is located at the northwest corner of the campus. The southern part of the structure, of native limestone, houses a reception room, offices, rooms for large and small animal examination, treatment, and surgery, student intern quarters, and a large auditorium seating 285.

The northern portion of the building, of reinforced concrete, has 54 stalls for large animals, of which 8 are heated. Clients may unload their animals at four different places.

The old hospital is to be remodeled to provide additional space for the departments of pathology and physiology, and for research in various phases of veterinary medicine.

Louisiana

State Association.—The twenty-fourth annual conference for veterinarians sponsored by the Department of Veterinary Science, Louisiana State University, was held in Baton Rouge on Feb. 1-2, 1955. The group was welcomed by **Dean J. G. Lee, Jr.**, College of Agriculture, and the response was given by **Dr. J. L. Melancon**, of Bunkie.

The program participants were **Drs. A. H. Quin**, Kansas City, Mo., president of the AVMA; **A. G. Madden, Jr.**, Madeira, Ohio; **John McCoy**, Paris, Texas; **Alexander Zeissig**, Merck and Co., Rahway, N. J.; **Mr. B. J. Burch**, Hammond; **Drs. T. E. Patrick**, Louisiana State University; and **J. Norman Efferson**, Louisiana State University.

On Wednesday afternoon, there was a discussion, under the leadership of **Dr. F. B.**

Wheeler, state veterinarian, and **Dr. E. E. Saulmon**, federal veterinarian in charge of the state brucellosis eradication program.

S/W. T. OGLESBY.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held Feb. 23, 1955, at the Hotel Beaconsfield in Boston.

Dr. Duke H. Ducor, Farmington, Conn., was the guest speaker.

The officers for 1955 are **Drs. C. M. deVarennes**, Quincy, president; **P. R. Granholm**, Weston, first vice-president; **H. M. Tabbut**, Wellesley Hills, second vice-president; and **C. Lawrence Blakely**, Needham, secretary-treasurer.

S/C. LAWRENCE BLAKELY, *Secretary*.

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Worcester County Association.—The Worcester County Veterinary Medical Association met on February 10 at the new hospital of **Dr. George Abbotts** in Worcester.

The program, a panel discussion of the brucellosis control program, was presided over by **Dr. D. N. Stern**, Amherst, extension veterinarian.

S/DONALD W. HEY, *Secretary*.

Michigan

Southeastern Association.—The Southeastern Michigan Veterinary Medical Association met at the Croatian Center, near Detroit, on February 23, with 50 members and guests in attendance. The guest speaker was **Dr. Wade O. Brinker**, Michigan State College, who discussed the dorsal approach to the coxofemoral joint.

The following officers have been elected to serve during 1955: **Drs. Jerry Hergott**, Dearborn, president; **John Donovan**, Grosse Pointe Farms, vice-president; **Gilbert Meyer**, Detroit, secretary; and **Charles Hodder**, Detroit, treasurer.

S/GILBERT MEYER, *Secretary*.

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M.S.C. Senior Honored.—When **Dr. Ray Elbing** (MSC '54), now of Oshkosh, Wis., was

Have you returned the questionnaire on AVMA sponsorship of national group health and accident insurance? It is important that you do so. Deadline—April 15, 1955

a senior veterinary student at Michigan State College, he was awarded (April, 1954) the first annual Sol Raskin award—a microscope. The award was established in honor of their father by Dr. Henry Raskin (MSC '46) of Detroit



Dr. Ray Elbing (left), Oshkosh, Wis., receiving the first annual Raskin award from Dr. Henry Raskin.

and Dr. John Raskin, a physician in California. It is not awarded on a scholarship basis but, after disqualifying any who have received awards, is decided by vote of the class. One of the criteria is, Which classmate would each most like to have for a partner in practice?

Missouri

Dr. Wells Honored.—Dr. John L. Wells (KCV '15), of Kansas City, was honored by the Missouri Veterinary Medical Association with the first annual award of "Missouri Veterinarian of the Year." Dr. Wells served as division veterinarian of the 80th Division in World War I, with the rank of major. He is sales manager of Haver-Glover Laboratories and editor of the *Haver-Glover Messenger*.

State Association.—The sixty-third annual convention of the Missouri Veterinary Medical Association was held Feb. 21-22, 1955, at the Hotel Jefferson in St. Louis.

The following speakers participated in the program: **Drs. W. A. Aitken**, Chicago, editor in chief, AVMA; **C. A. Brandy**, University of Wisconsin, Madison; **T. H. Brasmer**, Danville, Ill.; **E. J. Catcott**, Ohio State University, Columbus; **O. E. Ellis**, Paris, Mo.; **W. F. Guard**, Ohio State University, Columbus; **W. F.**

Irwin, Tulsa, Okla.; **G. R. Moore**, Michigan State College, East Lansing; **W. H. Mowder**, Independence; **G. L. Murphy**, Kirkwood; **A. H. Quin**, Kansas City, president of the AVMA; **L. A. Rosner**, state veterinarian, Jefferson City; **Frank Thorp, Jr.**, Michigan State College, East Lansing; **Lt. Col. Bernard P. Trum**, Agriculture Research Service, Oak Ridge, Tenn.; and **Mrs. Paul T. White**, Indianapolis, Ind.

s/PAUL L. SPENCER, Secretary.

Kansas City Association.—On February 15, members of the Kansas City Veterinary Medical Association met in the Livestock Exchange Building in Kansas City, to hear **Dr. Roy E. Nichols**, University of Wisconsin, discuss disorders affecting the functional activity of the rumen.

s/BUSCH MEREDITH, Secretary.

Greater St. Louis Association.—The Greater St. Louis Veterinary Medical Association and its Women's Auxiliary met at the Sheraton Hotel on February 4 to complete arrangements for the February 21-22 meeting of the Missouri Veterinary Medical Association.

s/LUTHER E. FREDRICKSON, Secretary.

Nebraska

Personal.—At the annual meeting of the Nebraska State Veterinary Medical Association on Dec. 2, 1954, Dr. S. W. Phillips of David City was voted to life membership in the Association. There are now 35 life members of this Association.

s/W. T. SPENCER, Secretary.

New Jersey

Morris Foundation Contributes to Study of Cat Nutrition.—The Rutgers University Bureau of Biological Research has received a grant of \$6,000 from the Mark L. Morris Animal Memorial Foundation of Topeka, to continue a year-old study of the basic nutritional requirements of the cat.

The Morris Foundation was organized several years ago in New Jersey to promote studies on the relationships of nutrition to the control of animal diseases and to promote graduate study in veterinary colleges.

New York

New York City Association.—At the February 2 meeting of the Veterinary Medical Association of New York City, Inc., **Dr. D. F. M. Bunce**, research physiologist, Armour Laboratories, Chicago, discussed an approach to the treatment of neurological conditions in dogs.

The guest speaker at the March 2 meeting was **Dr. James A. Baker**, director of the Veterinary Virus Research Institute, New York State Veterinary College, Cornell University, Ithaca. His subject was vaccination failures in dogs, with illustrations.

s/C. E. DeCAMP, Secretary.

North Dakota

Short Course.—The North Dakota Agricultural College held its annual short course for veterinarians at the Van Es Laboratory in Fargo on Feb. 14-15, 1955, with approximately 40 veterinarians in attendance.

The program participants were **Drs. T. R. Myers**, veterinarian in charge, ARS, U.S.D.A., Bismarck; **T. O. Brandenburg**, state veterinarian, Bismarck; **D. M. Hammond**, head, Zoological Department, Utah State Agriculture College, Logan; **D. A. Wire**, Valley City; **A. C. Todd**, University of Wisconsin, Madison; and **I. A. Schipper**, **F. M. Bolin**, **D. F. Eveleth**, and **R. F. Shumard** of the North Dakota Agricultural College faculty.

s/S. S. BJORNSEN, *Resident Secretary.*

Oklahoma

Dr. Mason Named Member of State Board.—Dr. W. S. Mason, Jr. (COL '45), Cordell, was named as a member of the three-man state board of affairs by Governor-Elect R. Gary. The board of affairs serves as the purchasing agent for all state institutions. It has charge of the operation of the capitol building and grounds and is the board of control over the state penitentiaries and other institutions. Dr. Mason is a past-president of the Oklahoma Veterinary Medical Association and a member of the AVMA. In addition to his practice, he also is associated with his father in farming and ranching operations near Cordell.

Ontario

Death of Dr. W. J. R. Fowler.—Dr. Wilfred James Richard Fowler, noted educator in veterinary medicine and a member of the Ontario Veterinary College faculty for 55 years, died in Guelph General Hospital on Feb. 13, 1955. He was 79 years old.

Born May 23, 1875, near Seaforth, Ont., Dr. Fowler received his early education there; he enrolled at Ontario Veterinary College in 1895 where he was an outstanding student and was graduated with honors in 1899 with the degree of V.S. He was appointed to the faculty at once and later did postgraduate work in Chicago as a result of which he received the B.V.Sc. degree from the University of Toronto in 1910. He taught surgery for a time and then set up a small animal practice in Toronto.

In 1918, Dr. Fowler returned to O.V.C. at the request of the late principal, Dr. C. D. McGilvray, to teach surgery, surgical therapeutics, and anatomy. When the college was removed to Guelph, he and his family took an active part in the social life of the community and Dr. Fowler soon began his long term of service as a member and, later, president of the board of directors of Guelph General Hospital.

He made frequent trips abroad, especially to Great Britain and France where he demon-

strated surgical techniques and operations in which he was especially skilled. He was also a leader in the activities of the Ontario Provincial Winter Fair, serving twenty years on its ex-



Dr. W. J. R. Fowler

ecutive committee and eight years as president of the fair board.

Dr. Fowler was the recipient of many honors from governments and universities including the Chevalier du Merit Agricole de France for his services to French Agriculture; the honorary degree of Doctor of Veterinary Medicine from the University of Montreal for his outstanding contributions to veterinary science; a testimonial dinner tendered in 1939 by the staff of O.V.C., marking forty years of professional service; and an award from the Ontario Veterinary Association on the occasion of being made a life member in 1950 after completion of fifty years of service.

More than 4,000 students had studied under Dr. Fowler at O.V.C. and up until his last illness he was lecturer and consultant in surgery and clinics at the College. He was an active member of veterinary associations, including the AVMA, to which he was admitted in 1911.

Surviving Dr. Fowler are his widow, the former Minnie E. Izzard, whom he married in 1900; his daughter, Mrs. M. Wilfreda Jackson of Cleveland, Ohio; two brothers and one sister, all of Mitchell, Ont.

Pennsylvania

Bucks-Montgomery Association.—The Bucks-Montgomery Veterinary Medical Association met on the evening of February 9 at the Moose Home in Doylestown to hear **Dr. A. Vansant** discuss practice problems.

s/V. W. RUTH, *Secretary.*

Keystone Association.—On February 23, **Dr. David K. Detweiler**, of the University of Penn-

sylvia faculty, discussed clinical aspects of canine heart disease before members of the Keystone Veterinary Medical Association.

The following speakers participated in the interprofessional meeting of the Keystone Association and the Philadelphia branch of the American Pharmaceutical Association at the Philadelphia College of Pharmacy and Science on March 9: **Drs. Raymond C. Snyder**, Upper Darby; **Joseph Sprowls**, dean, Temple University School of Pharmacy; **Mark Allam**, dean, University of Pennsylvania School of Veterinary Medicine; **David Detweiler**, Department of Physiology, University of Pennsylvania School of Veterinary Medicine; **Charles E. Fanslau**, director of the Veterinary Division, Winthrop-Stearns, Inc.; and **Linwood F. Tice**, assistant dean, Philadelphia College of Pharmacy and Science.

S/LEONARD KRAWITZ, *President*.

South Carolina

State Association.—The following officers were elected at the Jan. 22, 1955, meeting of the South Carolina Veterinary Association in Columbia: **Drs. Sam Galphin**, Holly Hill, president; **W. R. Beasley**, Batesburg, president-elect; **T. E. Brown**, Spartanburg, vice-president; and **Worth Lanier**, York, secretary-treasurer. The following members were elected to the executive and legislative committee: **Drs. F. B. Caughman, Jr.**, Columbia, chairman; **B. C. McLean**, Aiken; **R. R. Salley**, Orangeburg; **L. D. Rodgers**, Greenwood; **R. L. Willis**, Charleston; and **Drs. S. Galphin** and **W. Lanier**, *ex officio*.

The principal speaker was **Dr. R. W. Carter**, state livestock director, who presented the outline and policies of the brucellosis program as it will operate in South Carolina. The following committee reports were given: **Drs. M. R. Blackstock**, Spartanburg, delegate to the AVMA, reported on the Seattle meeting; **R. A. Mays**, Columbia, disease control section; **F. M. Lee**, rabies; **R. W. Carter**, Columbia, brucellosis program; **H. L. Sutherland**, Union, State Board of Veterinary Examiners; and **F. P. Caughman, Jr.**, executive committee.

Nine new members were admitted to the Association at this meeting.

S/FRANK M. LEE, *Resident Secretary*.

Utah

Intermountain Association.—The twenty-seventh annual meeting of the Intermountain Veterinary Medical Association was held Jan. 17-19, 1955, in the Hotel Utah in Salt Lake City.

The following speakers addressed the scientific sessions: **Drs. David L. Coffin**, Angell Memorial Animal Hospital, Boston; **Floyd Cross**, president-elect of the AVMA and dean of the School of Veterinary Medicine, Colorado A. & M. College, Fort Collins; **George N. Glover**, Torrington, Wyo.; **Eric Isakson**, Ogden; **Rue Jensen**, William V. Lumb, A. Donald Rankin,

and **Lee Seghetti**, School of Veterinary Medicine, Colorado A. & M. College; **H. E. Kemper**, Agriculture Research Service, U.S.D.A., Albuquerque, N. M.; **A. K. Kuttler**, Agriculture Research Service, U.S.D.A., Washington, D. C.; **Busch Meredith**, Ashe Lockhart, Inc., Kansas City, Mo.; **N. J. Miller**, Eaton, Colo.; **Carl Norden, Jr.**, Norden Laboratories, Lincoln, Neb.; **M. D. Reimenschneider**, state veterinarian, Denver, Colo.; **Leif N. Ringen** (Ph.D.), College of Veterinary Medicine, State College of Washington, Pullman; **A. S. Rosenwald**, University of California, Davis; **John W. Safford**, Veterinary Research Laboratory, Montana State College, Bozeman, Mont.; **James H. Steele**, chief, Veterinary Public Health, U. S. Public Health Service, Atlanta, Ga.; **E. C. Stone**, dean, College of Veterinary Medicine, State College of Washington, Pullman; **V. L. Sharp**, College of Veterinary Medicine, Ohio State University, Columbus; and **E. A. Tugaw**, Salt Lake City.

The new officers installed at this meeting are: **Drs. C. H. Good**, Cheyenne, Wyo., president; **Hugh Hurst**, Salt Lake City, president-elect; **E. A. Tunncliff**, Bozeman, Mont., first vice-president; **Edward E. Maas**, Reno, Nev., second vice-president; and **Edward A. Tugaw**, Salt Lake City, Utah, secretary-treasurer.

S/EDWARD A. TUGAW, *Secretary*.

West Virginia

Correction.—**Dr. H. J. Fallon**, Huntington, W. Va., advises that since 1863 West Virginia and Virginia have been separate states—this to correct our error in the February JOURNAL (p. 162) in reporting under "Virginia" a resolution adopted at the annual meeting of the West Virginia Veterinary Medical Association which was held in Morgantown, W. Va., in October, 1954.

Wisconsin

Dr. Ferguson Honored.—At the annual banquet session, on February 2, in Madison, Wis., of the 1955 Farm and Home Week, **Dr. Thomas H. Ferguson** (ONT '96), Lake Geneva, was one of six honored for outstanding service to rural life. He was cited as "a valued counselor to farm people and a leader in maintaining high standards for his profession."

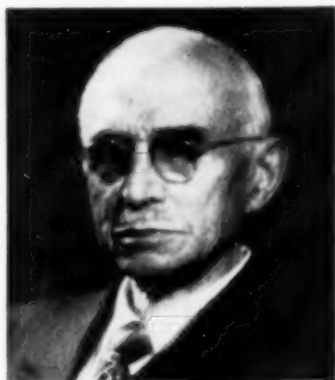
Dr. Ferguson has been active in promoting tuberculosis and brucellosis control programs in Wisconsin, and has helped develop and carry out other animal disease control programs in his area.

He has lectured in most of the major veterinary colleges in the United States and Canada and, in 1938, was one of nine men to receive the golden key of the American Veterinary Medical Association for outstanding service to the veterinary profession.

In 1945, *Look* magazine featured him in a "pictorial day in the life of an animal doctor."

and in 1946 he received the Twelfth International Veterinary Congress prize of the American Veterinary Medical Association "in recognition of distinguished services to veterinary medical science."

Dr. Ferguson is a member of the Wisconsin



Dr. Thomas H. Ferguson

State Board of Veterinary Examiners, a past-president of the Wisconsin Veterinary Medical Association, and a member of the National Livestock Sanitary Board. He is on the Committee on Veterinary Services for Farm Animals and the Committee on Training Veterinarians, both with the National Research Council.

Personal.—Dr. C. W. Burch, extension veterinarian at the University of Wisconsin, has called attention to the fact that the University Circular No. 487 entitled "Controlled Brucellosis, 8 Steps to a Clean Herd," has been translated and used almost verbatim in a release from Bonn to the farmers of West Germany.

FOREIGN NEWS

British West Indies

Trinidad Branch of Caribbean Association.

The Trinidad Branch of the Caribbean Veterinary Medical Association held their first meeting of 1955 on February 4.

The meeting was presided over by Dr. L. Hutson, president. Communications with the Jamaican Branch, discussing the probability of holding a second veterinary convention in 1956 in Jamaica were discussed and approved by this branch.

Dr. Holman Williams presented a paper on "The Transmissible tumors of Dogs," and an interesting discussion took place afterward on the prevalence of lymphogranuloma venereum which is so prevalent in dogs on Trinidad.

s/S. P. BENNETT, Correspondent.

STATE BOARD EXAMINATIONS

North Carolina—The North Carolina Veterinary Medical Examining Board will meet at the Kitty Hotel, Wrightsville Beach, N. Car., on June 20-22, 1955. James I. Cornwell, 65 Beverly Rd., Beverly Hills, Asheville, N. Car., secretary.

VETERINARY MILITARY SERVICE

New Course in Veterinary Food Inspection at Medical Field Service School.—Graduation from the Meat and Dairy Hygiene Course at the Brooke Army Medical Center, Fort Sam Houston, Texas, marked the end of eight weeks' intensive training for the 21 students who made up the initial class to complete this course at the Medical Field Service School on Nov. 19, 1954. This center, the largest installation of its kind in the world, is fully equipped to provide technical training of all types to medical service personnel on a level unsurpassed by any other establishment.

The graduating group consisted of nonveterinary personnel although a few preveterinary students were included. They will be assigned throughout the United States and in foreign countries. They received a comprehensive course of instruction in all phases of food inspection and technology in preparation for their duties as assistants to Veterinary Corps officers who are engaged in food inspection activities for the Armed Forces. The instruction was highlighted by the extensive use of modern training aids, numerous demonstrations, practical exercises, and field trips to food-processing establishments. During the final week of training, the entire class and faculty were air-lifted to Fort Worth, Texas, for a two-day exercise designed to cover all phases of the training program. The extensive facilities of the Fort Worth Quartermaster Depot, the Quartermaster Market Center, the large food-processing plants, and the Fort Worth army food inspection detachment were utilized.

s/W. E. JENNINGS.

BIRTHS

Dr. (COL '54) and Mrs. Harold Blanc, Oakland, Neb., announce the birth of a daughter, Kathy Ann, on Jan. 6, 1955.

Dr. (GA '51) and Mrs. Earl L. Knox, Raleigh, N. Car., announce the birth of a son, Kevin Lee, on Jan. 9, 1955.

Dr. (TEX '43) and Mrs. Ashley J. Clark, Jr., Irving, Texas, announce the birth of a son, David Ashley, on Jan. 17, 1955.

Dr. (UP '48) and Mrs. R. G. Ainley, Santa Maria, Calif., announce the birth of a daughter, Cheryl Rae, on Feb. 3, 1955.

Dr. (TEX '49) and Mrs. Troy C. White, Breezy Point, Athens, Texas, announce the birth of a daughter, Janna, on Jan. 18, 1955. Janna has a 4-year-old sister, Suzanne.

DEATHS

The unusually large number of deaths reported in this issue of the JOURNAL is the result of information received from a clipping service to which the AVMA recently subscribed and also to the response to a recent professional classification check of veterinarians in the United States and Canada.

Newton D. Baldwin (GR '05), 78, Ludington, Mich., died Jan. 25, 1955. Dr. Baldwin, a general practitioner, had retired in 1949. His widow survives him.

Charles F. Berry (MCK '08), 75, Ottawa, Ill., died Jan. 21, 1955. Dr. Berry was a general practitioner. He is survived by his widow and two sons.

John P. Block (MCK '18), Daysland, Alta., died recently (date not known). Dr. Block was a general practitioner.

Eric W. Bond (ONT '22), Ottawa, Ont., died recently (date not known). Dr. Bond was employed for several years by the Poultry Pathology Laboratory at the Central Experimental Farm in Ottawa.

Irvin F. Brenning (COR '23), 62, Fayetteville, N. Y., died Jan. 16, 1955. Dr. Brenning, a general practitioner, was a member of the New York State and Western New York Veterinary Medical Associations and of the AVMA. He is survived by his widow, a daughter, and four grandchildren.

Claude E. Brewer (MCK '12), 73, Atkinson, Neb., died Oct. 19, 1954. Dr. Brewer had practiced in northern Nebraska for more than forty years and in Atkinson for about thirty years. He is survived by his widow, one daughter, and one grandson.

A. J. Bruns (IND '17), 58, Millhousen, Ind., died Dec. 15, 1954. Dr. Bruns, who had practiced in Ripley and Decatur counties for thirty-seven years, was a member of the Indiana Veterinary Medical Association and of the AVMA. He is survived by his widow, one daughter, four sons, and seven grandchildren.

Atwood Buckmaster (GR '08), 79, Montpelier, Ind., died Dec. 29, 1954. Dr. Buckmaster had specialized in poultry practice and was active in civic affairs of his community having served as councilman and as a member of the hospital and library boards of Montpelier. He is survived by his widow, two daughters, three sons, twelve grandchildren, and one great grandchild.

Frank R. Clapp (ONT '07), Picton, Ont., died Oct. 21, 1954. Dr. Clapp was born in Pic-

ton and, after receiving his degree in veterinary medicine, practiced there for forty-seven years, retiring in June of 1954. He was a member of the Ontario and Bay of Quinte Veterinary Medical Associations. Dr. Clapp is survived by his widow, one daughter, and two sons, James (ONT '50) and Robert (ONT '54), both of whom had joined him in practice in Picton.

Raymond C. Coulson (OSU '24), Santa Barbara, Calif., died recently (date not known). Dr. Coulson had retired from practice several years ago.

Volney M. Curry (ONT '06), 73, Mason, Mich., died Sept. 5, 1954. Dr. Curry had practiced in a number of central Michigan areas, including Midland and Laingsburg, for many years before his retirement five years ago. He is survived by one daughter.

Ernest J. Dettman (MCK '11), 69, Union City, Ind., died Jan. 2, 1955. Dr. Dettman, a general practitioner, had served in the Veterinary Corps, U. S. Army, during World War I. He is survived by his widow. He had been a member of the AVMA.

Joseph A. Donaghue (ONT '08), 77, Santa Cruz, Calif., died Feb. 6, 1955. Dr. Donaghue had retired from his position as meat inspector for the State of California. He had been for several years a member of the AVMA. Dr. Donaghue is survived by his widow.

Earl M. Feelyater (CVC '11), 67, Madison, Wis., died Jan. 3, 1955. Dr. Feelyater had been a member of the AVMA. He is survived by his widow.

Harry T. Fiske (CVC '11), 72, New York Mills, Minn., died Jan. 15, 1955. Dr. Fiske is survived by his widow.

Dr. Wilfred J. R. Fowler (ONT '09), 79, Guelph, Ont., died Feb. 13, 1955. Dr. Fowler had been a member of the AVMA. An obituary appears on page 349 of this JOURNAL.

Henry H. Gibson (ONT '19), Newport, N. S. (Canada), died recently (date not known). Dr. Gibson had retired from practice a number of years ago.

Thomas L. Graham (MCK '15), 62, Arthur, Ill., died Jan. 20, 1955. Dr. Graham had practiced in Arthur since 1917. He was a member of the Illinois Veterinary Medical Association and of the AVMA. Dr. Graham is survived by his widow and two sons, Dr. (OSU '48) T. L. Graham, Jr., of Arthur, and Robert, a student at the University of Illinois.

William A. Henderson (ONT '03), Stratford, Ont., died recently (date not known). Dr. Henderson had been a member of the AVMA.

David M. Hoyt (NYS '15), 61, Canastota, N. Y., died Feb. 1, 1955. Dr. Hoyt was a general practitioner. He is survived by his widow and a son.

John C. Humphreys (KCV '10), Trenton,

Mo., died in 1951. Dr. Humphreys was a general practitioner.

Joseph Huston (ONT '14), Carman, Man., died in June, 1954. Dr. Huston was a general practitioner. He is survived by his widow.

Martin L. Hutchins (UP '16), 62, Sunbury, Pa., died Dec. 12, 1954. Dr. Hutchins had retired from practice. He had been for many years a member of the AVMA.

Roscoe T. Jett (IND '16), 66, Hopkinsville, Ky., died July 8, 1953. Dr. Jett, a general practitioner, was a semi-invalid for three years before his death. He is survived by his widow.

Joseph M. Kaiser (CVC '04), 79, Berwyn, Ill., died Aug. 27, 1954, after a prolonged illness. Dr. Kaiser was a member of the Illinois Veterinary Medical Association and of the AVMA. He is survived by his widow, two brothers, and a sister.

Thomas H. Kindred (MCK '17), 71, Sioux Falls, S. Dak., died Oct. 22, 1954. Dr. Kindred, a general practitioner, had been a member of the AVMA. He is survived by his widow.

Richard Klaiber (CIN '10), West Carrollton, Ohio, died recently (date not known). Dr. Klaiber had been a member of the AVMA for several years.

Theodore A. Koff (CVC '08), 68, Trenton, Mo., died Oct. 4, 1954, from a heart attack. Dr. Koff is survived by a daughter and two grandsons. He had been a member of the AVMA.

Dr. John J. Larson (CVC '18), 79, St. Cloud, Minn., died Oct. 28, 1954. Dr. Larson had operated a small animal hospital up until his retirement eight years ago. He is survived by his widow, a son, a daughter, and a grandchild.

Oscar C. Lofgren (MCG '92), Sunburg, Minn., died Nov. 25, 1954. Dr. Lofgren, a general practitioner, had retired several years ago.

Leslie E. Long (CVC '20), Grenada, Miss., died in January, 1952. Dr. Long, a general practitioner, had been a member of the AVMA.

Ora E. Lowe (IND '12), Charlottesville, Ind., died Feb. 4, 1955. Dr. Lowe, who had practiced in Charlottesville for the past forty-three years, was a member of the AVMA. He is survived by his widow, two brothers, and a sister.

Charles A. Mack (ONT '01; MCK '02), 81, St. Paul, Minn., died Jan. 11, 1955. Dr. Mack had served for twenty-six years with the Minnesota Livestock Sanitary Board. He had also practiced in Stillwater for about twelve years and operated a farm in Manitoba, Canada, where he was born. He was a member of the Minnesota Veterinary Medical Association and of the AVMA, to which he was admitted in 1903. Dr. Mack is survived by his widow, two sons, and a daughter.

Angus H. MacLeod (ONT '16), 61, Schomberg, Ont., died recently (date not known).

Dr. MacLeod was a general practitioner. He was a member of the Ontario Veterinary Association and had been a member of the AVMA.

John C. McMichael (CVC '11), Jerseyville, Ill., died (date not known). Dr. McMichael had retired from practice in 1937 because of ill health.

John Magill (CVC '14), 67, Timberville, Va., died Dec. 19, 1954. Dr. Magill was a poultry inspector for the Agricultural Marketing Services of the U. S. Department of Agriculture and had previously served with the U. S. BAI. He served with the Canadian Expeditionary Force during World War I and was severely wounded. He later obtained a commission with the Canadian Army Veterinary Corps with the rank of captain. He was a member of the AVMA. Dr. Magill is survived by his widow.

P. J. Mertz (ONT '95), 82, Honey Brook, Pa., died Jan. 31, 1955. Dr. Mertz had practiced in Honey Brook for sixty years. He is survived by two sons, two daughters, two grandchildren, and four great grandchildren.

Willis A. Meyers (CHI '94; USC '05), 81, Wenona, Ill., died Nov. 14, 1954. Dr. Meyers, for the past twelve years postmaster of Wenona, had been assistant state veterinarian for several years and had served in the Spanish-American War and World War I. He is survived by his widow.

Lloyd J. Michael (KSC '34), 46, Spring Hill, Kan., was killed Jan. 20, 1955, in an automobile accident. Dr. Michael, a veteran of World War II, was a member of the Kansas Veterinary Medical Association and of the AVMA. He is survived by his widow and two daughters.

George L. Millerick (SF '16), 62, Oakland, Calif., died Jan. 31, 1955. Dr. Millerick was a general practitioner. He had been a member of the AVMA for thirty years.

William J. Mulroony (MCK '11), 70, Nampa, Idaho, died Dec. 8, 1954. Dr. Mulroony practiced in North Dakota a number of years and then went to Idaho where he served as meat inspector with the BAI until his retirement in 1952.

Lester C. Neer (OSU '19), Middletown, Ohio, died recently (date not known). Dr. Neer was a meat inspector for Middletown.

Charles A. Nelson (KCV '08), 85, Brainerd, Minn., died Jan. 25, 1955. Dr. Nelson was born in Sweden and came to the United States at the age of 12. He had practiced in Brainerd for forty-six years. He was active in civic and professional groups and was a member of the Minnesota Veterinary Medical Association and a life member of the AVMA. He is survived by his widow.

Charles O. Netherton (CVC '94), 84, Gallatin, Mo., died Oct. 7, 1954. Dr. Netherton, a

general practitioner, retired in 1948. He is survived by four sons, all physicians, 14 grandchildren, and 17 great grandchildren.

Fred L. Ober (CVC '07), Upland, Calif., died recently (date not known). Dr. Ober had retired a number of years ago.

Newell E. Peigh (CVC '20), Hamlet, Ind., died Jan. 23, 1955, from injuries received in an automobile accident. Dr. Peigh had been in general practice in Hamlet for more than thirty years. He is survived by his widow; two sons, Dr. H. V. (MSC '47) of LaCrosse, Ind., and Dr. D. R. (MSC '49) of Chicago, Ill.; and his mother.

Robert Porteus (OSU '10), 67, Bellefontaine, Ohio, died Dec. 11, 1954. He had been in ill health for more than a year from injuries received in an automobile accident. Dr. Porteus, a general practitioner, had served in World War I. He is survived by his widow and a daughter.

Clark A. Philips (ONT '04), Port Elgin, Ont., died recently (date not known). Dr. Philips was a general practitioner.

Mark A. Quilty (UVC '03), 76, Lake Charles, La., died Nov. 10, 1954, from injuries received in an automobile accident twelve days previously. Dr. Quilty, a general practitioner, was a member of the Louisiana Veterinary Medical Association and of the AVMA.

Charles P. Quirin (MCK '12), 71, Smithton, Ill., died Jan. 20, 1955. Dr. Quirin was state veterinarian at the National Stock Yards from 1933 until his retirement in 1951. He had previously been in practice at Smithton for twenty-one years. Dr. Quirin had been active in civic affairs and had served as mayor of Smithton and as chairman of the board of village trustees for seven years. He is survived by his widow, two sons, a daughter, and four grandchildren.

Wayne C. Reed (OSU '17), Akron, Ohio, died recently (date not known). Dr. Reed was a small animal practitioner.

Walter W. Renter (CIN '07), 80, Cincinnati, Ohio, died in 1950. Dr. Renter, who served with the U. S. Bureau of Animal Industry, was for forty years a member of the AVMA.

Richard K. Roberson (API '16), 61, Columbus, Ga., died Oct. 23, 1954. Dr. Roberson had practiced in Columbus for thirty-six years and was a veteran of World War I. He is survived by his widow, a son, and a daughter.

C. C. Schilt (ONT '16), North Portal, Sask., died recently (date not known). Dr. Schilt had been in government work.

Walter L. Sharer (IND '16), Clayton, Ind., died recently (date not known). Dr. Sharer was a general practitioner.

Don I. Skidmore (OSU '04), 73, Washington, D. C., died Feb. 28, 1955. Dr. Skidmore was a member of the AVMA. An obituary appears on page 344 of this JOURNAL.

Andreas I. Sorensen (ONT '08), 77, Stockton, Calif., died Oct. 15, 1954. Dr. Sorensen had retired from practice. He was a member of the California Veterinary Medical Association and of the AVMA.

Harry D. Sparks (ONT '11), Ottawa, Ont., died in January, 1948. Dr. Sparks had been employed by the city of Ottawa.

Roy H. Spaulding (COR '15), 61, Shenorock, N. Y., died Oct. 18, 1954. Dr. Spaulding was a member of the New York State Veterinary Medical Association and had been a member of the AVMA for more than thirty years.

Albert M. Taylor (CVC '97), 76, White Bear Lake, Minn., died Nov. 11, 1954. Dr. Taylor had been for many years a member of the AVMA. He is survived by his widow.

Brainard L. Taylor (KSC '20), 59, Monroe, Wash., died of a heart attack on Oct. 19, 1954. Dr. Taylor had practiced in Monroe for twenty-five years.

Lewis E. Tuttle (SF '07), 73, Willows, Calif., died Nov. 15, 1954, of injuries received in an automobile accident. Dr. Tuttle, a general practitioner, was also county livestock inspector. He is survived by his widow, a son, and three daughters.

Fletcher L. Vinson (API '18), 57, Baltimore, Md., died Feb. 3, 1955. Dr. Vinson had judged many of the major dog shows of the nation and was active in civic and professional organizations. He was a member of the Maryland Board of Veterinary Medical Examiners, American Animal Hospital Association, Maryland Veterinary Medical Association and of the AVMA to which he was admitted in 1929. He also raised blooded cattle on his farm at Glen Arm. Dr. Vinson is survived by his widow, a daughter, a sister, and a brother, Dr. (API '30) Bryant C. Vinson, who was associated with him in practice.

Robert Von Tour (COL '49), 32, Quincy, Calif., died Nov. 9, 1954, from injuries received in an automobile accident. Dr. Von Tour was a general practitioner. He is survived by his widow, Dr. (COL '50) Jennette G. Von Tour, and a son, Robert Gregory.

William B. Washburn (ONT '93), 81, Tiffin, Ohio, died in 1952. Dr. Washburn was a general practitioner. He was a member of the U. S. Livestock Sanitary Association, the Ohio State and Northwestern Ohio Veterinary Medical Associations, and of the AVMA.

Harry R. Weakley (USC '13), 69, Annapolis, Md., died May 26, 1954. Dr. Weakley, a general practitioner, had been a member of the AVMA. He is survived by his widow.

Clifton L. Whittington (CVC '10), Postville, Iowa, died recently (date not known). Dr. Whittington had been employed by the U. S. BAI.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

- Washington State College. Spring conference for veterinarians. College of Veterinary Medicine, State College of Washington, Pullman, Wash., April 4-6, 1955. R. W. Leader, chairman, Spring Conference Committee.
- Pennsylvania, University of. Postgraduate short courses for veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., April 4-7, 1955. M. W. Allam, dean.
- Animal Disease Research Workers in the Southern States. Annual meeting. Animal Pathology Building, Experiment Station Farm, University of Kentucky, Lexington, Ky., April 5-6, 1955. Paul L. Piercy, University of Georgia, Athens, Ga., secretary.
- Central Iowa Veterinary Medical Association. Annual meeting. Warden Hotel, Fort Dodge, Iowa, April 21, 1955. H. Engelbrecht, P. O. Box 797, Fort Dodge, Iowa, secretary.
- Oregon State Veterinary Medical Association. Klamath Falls, Ore., April 30, 1955. E. L. Holden, P. O. Box 445, Oswego, Ore., secretary.
- American Animal Hospital Association. Annual meeting. Hotel Statler, Detroit, Mich., May 4-7, 1955. Wayne H. Riser, Skokie, Ill., executive secretary.
- Eastern Iowa Veterinary Association, Inc. Annual all-day practitioners' clinic. Hawkeye Downs, Cedar Rapids, Iowa, Tuesday, May 10, 1955. Robert E. Savage, Monticello, Iowa.
- Pennsylvania, University of. Symposium on Helminthic Problems in Veterinary Medicine. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., May 10, 1955, beginning at 9:00 a.m. John E. Martin, assistant professor of physiology and pharmacy.
- Georgia Veterinary Medical Association. Annual meeting. Biltmore Hotel, Atlanta, Ga., May 29-31, 1955. Chas. C. Rife, 420 Edgewood Ave., N.E., Atlanta, Ga., secretary.
- Texas, A. & M. College of. Conference for veterinarians. Memorial Student Center, College Campus, College Station, Texas, June 2-3, 1955. Alvin A. Price, chairman.
- Wyoming Veterinary Medical Association. Annual meeting. Casper, Wyo., June 12-13, 1955. John F. Ryff, P.O. Box 960, Laramie, Wyo., secretary.
- Montana Veterinary Medical Association. Annual meeting. Great Falls, Mont., June 15-17, 1955. E. A. Tunnicliff, Agriculture Experiment Station, Bozeman, Mont., secretary.
- Utah Veterinary Medical Association. Annual meeting. Ogden, Utah, June 20-22, 1955. E. A. Tugaw, 3015 S. State St., Salt Lake City, Utah, secretary.
- North Carolina State Veterinary Medical Association. Annual meeting. Kitty Hotel, Wrightsville Beach, N. Car., June 21-22, 1955. Clyde W. Young, Mocksville, N. Car., secretary.
- Maryland State Veterinary Medical Association. Summer meeting. George Washington Hotel, Ocean City, Md., June 23-24, 1955. John D. Gadd, Cockeysville, Md., secretary.
- Idaho Veterinary Medical Association. Annual meeting. McCall, Idaho, June 23-25, 1955. A. P. Schneider, 2025 N. 23rd St., Boise, Idaho, secretary.
- Maritime Veterinary Associations. Joint conference. Mount Allison University, Sackville, N. B., June 28-30, 1955. J. F. Frank, Sackville, N. B., secretary, joint committee.
- Alabama, Conference for Veterinarians. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala., July 24-27, 1955. R. S. Sugg, dean.
- American Veterinary Medical Association. Annual meeting. Municipal Auditorium, Minneapolis, Minn., Aug. 15-18, 1955. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.
- Colorado Veterinary Medical Association. Annual meeting. Steamboat Springs, Colo., Sept. 14-16, 1955. Walter R. Haas, Eaton, Colo., secretary.
- New York State Veterinary Medical Society. Annual meeting. Hotel Statler, New York, N. Y., Sept. 14-16, 1955. Joan S. Halat, 803 Varick St., Utica, N. Y., acting executive secretary.
- Oklahoma A. & M. College. Conference for veterinarians. School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Okla., Sept. 29-30, 1955. J. D. Friend, Department of Veterinary Anatomy, chairman.

Foreign Meetings

- Seventh International Congress of Comparative Pathology. Institute of Pathological Anatomy, Lausanne, Switzerland, May 26-31, 1955. The General Secretary, 19 Rue César-Roux, Lausanne, Switzerland. (Dr. Lee M. Hutchins, Division of Forest Disease Research, Forest Service, U.S.D.A., Washington 25, D. C., chairman, United States Section of the Congress.)
- Third International Congress of Biochemistry. Brussels, Belgium, Aug. 1-6, 1955. Claude Liebecq, 17 Place Delcour, Liege, Belgium, secretary general.

(Continued on p. 32)

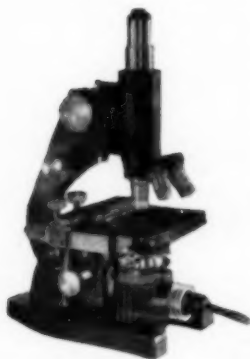


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Regularly Scheduled Meetings

Atlanta (Ga.) Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Central Arizona Veterinary Medical Association, the second Tuesday of each month. F. R. Benton, 302 South Country Club Dr., Mesa, Ariz., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month.

Herbert Piper, 4575 Ventura Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., La-Grange, Ill., secretary.

Coastal Bend (Texas) Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month, September through May (except

(Continued on p. 34)

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- January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.
- East Bay (Calif.) Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.
- Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.
- Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Kinston, N. Car., secretary.
- Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.
- Greater St. Louis (Mo.) Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 25, Municipal Courts Bldg., St. Louis, Mo., secretary.
- Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon. Houston. Texas. secretary-treasurer.
- Jacksonville (Fla.) Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.
- Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.
- Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.
- Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.
- Kern County (Calif.) Veterinary Medical Association, the first Thursday of each month. W. W. Stiern, 17 Niles St., Bakersfield, Calif., secretary.
- Keystone (Pa.) Veterinary Medical Association,

(Continued on p. 36)

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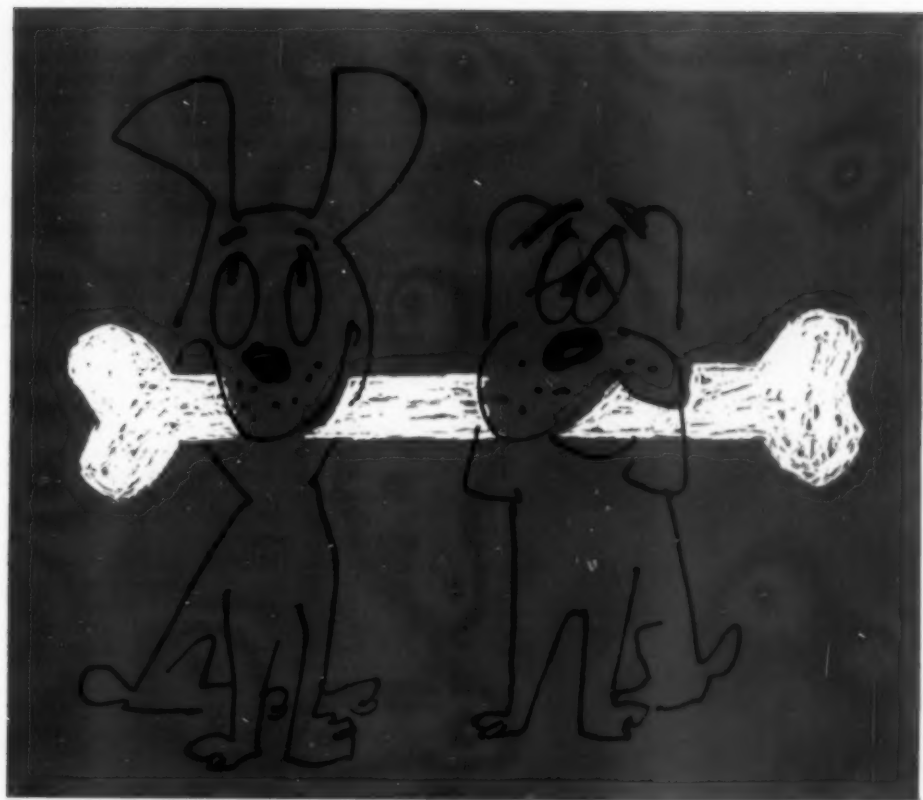
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Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St. W., Huntington, W. Va.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McColister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Mid-State (Mich.) Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area (Calif.) Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campell, 90 Corral de Tierra, Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

(Continued on p. 38)

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Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northern Colorado Veterinary Medical Society, the second Monday of each month. William H. Beckenhauer, School of Veterinary Medicine, Colorado A. & C. College, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Ernest Makino, Patterson, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County (Calif.) Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula (Calif.) Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Piedmont (N. Car.) Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Pima County (Ariz.) Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H. M. Strandberg, 203 D St., Petaluma, Calif., secretary.

(Continued on p. 40)

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Saginaw Valley (Mich.) Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month except July and August. E. R. Quortrup, 4005 Rosecrans St., Building 2, San Diego, Calif., secretary.

San Fernando Valley (Calif.) Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R., Des Rosiers, 5508 2nd Ave. N. W., Seattle 7, Wash., secretary.

Southeastern (Mich.) Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. J. C. Matlock, 4561 Ponce DeLeon Blvd., Coral Gables, Fla., secretary.

South Puget Sound (Wash.) Veterinary Medical Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

Tenth District (Ind.) Veterinary Medical Association, the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

Tulsa (Okla.) Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

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BRAND OF OXYTETRACYCLINE
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GOOD
RESULTS
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CLASSIFIED ADVERTISEMENTS

Personal Want Ads—\$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

Commercial Want Ads—\$5.00 for the first 25 words, 25 cents for each additional word.

Remittance must accompany order.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted for small animal practice in greater Cleveland, Ohio. Experience unnecessary; permanent position leading to percentage or partnership. Address "Box L 3," c/o JOURNAL of the AVMA.

Veterinarian wanted to assist in small animal practice in central New Jersey. State qualifications and salary expected. Address "Box L 6," c/o JOURNAL of the AVMA.

Veterinarian with practice experience, preferably in hog belt, wanted by manufacturer of veterinary biologicals. Headquarters in Sioux City, Iowa or Indianapolis, Ind.; salary, bonus, car, life and health insurance plans, retirement plan. Address "Box J 19," c/o JOURNAL of the AVMA.

Veterinarian wanted for Detroit animal hospital, \$125 with living quarters available. Address "Box K 12," c/o JOURNAL of the AVMA.

Attractive proposition in Clio, Michigan, for graduate veterinarian; a fast growing community with 200,000 persons within a fifteen-minute drive. Finance available. Address "Box J 7," c/o JOURNAL of the AVMA.

Good opportunity for future for veterinarian graduated from recognized college to assist in mixed practice in northern Illinois. In reply state age, experience, marital status, starting salary desired, et cetera. Address "Box J 22," c/o JOURNAL of the AVMA.

Position open in Middlewest, 3-man mixed practice. Salary plus commission; give references and qualifications in first letter. Address "Box L 24," c/o JOURNAL of the AVMA.

(Continued on p. 44)

Have you returned the questionnaire on AVMA sponsorship of national group health and accident insurance? It is important that you do so. Deadline—April 15, 1955

PAR EXCELLENCE...

Disinfectant par excellence—for all instruments! KORE will not rust or dull cutting edges! Merely mix 1 tablespoonful in a quart of tap water. Use KORE solutions for sterile storage of syringes and all instruments including teat and ear instruments.



Antiseptic par excellence—for all surgical procedures! Use KORE for preparing the surgical site, for sponging body tissues and for syringing minor wounds. KORE is buffered so as to be safe for body tissues and open wounds when diluted as directed on the package.



Cleaner and deodorant par excellence! KORE gives you one product which eliminates the need for separate soaps, deodorants and disinfectants. KORE is all three! KORE works fast, is easy to apply and saves time. It's concentrated—just 1 tablespoonful will sanitize all the equipment in an operating room.



KORE is a powder combining quaternary ammonium salts with powerful synergists. It is economical to buy, easy to store and quick to mix in office or field. KORE solutions are clear and non-staining; they may be kept indefinitely without losing strength.

For shelf control, 2-pound paper boxes are available either singly or in cases of one dozen. KORE is also available in convenient 11-pound tins, or in bulk, 25, 50 and 100-pound drums. Full directions for use are on every package. KORE may be ordered from dealers throughout the United States.

DISTRIBUTED BY
VETERINARY PRODUCTS DIVISION, KING RESEARCH, INC.
114 - 12 STREET • BROOKLYN 15, N. Y.

FUNGASARC

**for the effective treatment
of skin conditions**

Destroys fungi; sarcoptes scabiei canis; demodex canis; mites; fleas; lice. Repels ticks. Non Staining; not greasy; has no objectionable odor, destroys odors of external origin. Non Toxic; may be used daily in recommended dilution. Concentrated; one gallon makes four.

Gallon

\$13.95

Makes 4 gallons

Quart

\$4.00

Makes a gallon

**Available nationally through
well known Distributors**

Osco Chemical Company, Inc.

P.O. Box 2157, Atlanta 1, Georgia



RIVERSIDE ALL STEEL KENNELS—QUALITY FIRST

MANUFACTURED IN 5, 7, AND 8, CAGE UNITS. EQUIPPED WITH BALLBEARING CASTERS AT NO EXTRA COST. MINOR CHANGES IN DESIGN OPTIONAL. SLIDING PANELS BETWEEN CAGES IF DESIRED. STEEL-BARRED DOORS AND ESCAPE-PROOF LATCHES. NEW TYPE DOOR FRAMES WILL NOT COLLECT DIRT. VENTILATING STRIP IN LOWER CAGES. GALVANIZED STEEL USED.

Send For
Descriptive Literature

TERMS MAY BE ARRANGED IF DESIRED

*A lifetime of service and guaranteed by one of
California's oldest iron works.*

RIVERSIDE IRON WORKS

5422 Mission Blvd.

Riverside, California

(CLASSIFIED ADS—continued from p. 42)

Veterinarian wanted for active, well-equipped, small animal hospital. Permanent position, good salary, furnished apartment for single or married person. Connecticut license required. Send information to Dr. John Nickerson, Long Ridge Road, Stamford, Conn.

Veterinarian wanted to take over small animal hospital in Texas city of 150,000; also some large animal practice. Little or no capital required. Address "Box L 18," c/o JOURNAL of the AVMA.

Position available for recent graduate to assist in growing general practice in eastern New York State. State qualifications and salary expected in first letter. Address "Box L 22," c/o JOURNAL of the AVMA.

Wanted—Positions

Recent graduate of AVMA-approved school desires position leading to eventual partnership, lease, or sale in New Jersey. Address "Box L 4," c/o JOURNAL of the AVMA.

Experienced German veterinarian, 38, graduated from Hannover Veterinary College, Germany, 1940, presently in Ontario, desires to assist in general practice. Available May 15. Address "Box L 7," c/o JOURNAL of the AVMA.

Experienced relief veterinarian available; small animals only. New York and New Jersey licenses. Address D.V.M., 1007 80th St., North Bergen, N. J.

Graduate of AVMA-approved school desires position with progressive small animal practitioner. Age 30. Experienced, 6 years, general practice; 1 year, small animals (Army). Recently completed Army service (2 years). Married, ambitious, willing, and cooperative. Address "Box L 9," c/o JOURNAL of the AVMA.

Graduate AVMA-approved school desires teaching position or association with ethical pharmaceutical establishment. Eleven years' experience mixed practice and government duties. Married. Address "Box L 21," c/o JOURNAL of the AVMA.

(Continued on p. 46)

M·A·C



**Quick relief for Bone,
Bursal or Tendon Lameness**
Single Bottle \$2.00
3 and 1 free 5.00
6 and 2 free 9.00
12 and 4 free 17.00
24 and 4 free 28.00

**CARTER-LUFF CHEMICAL CO.
Hudson, N. Y.**

for nonspecific dermatoses...

*get prompt,
effective control
with*

SELEEN[®]

(Selenium Sulfide, Abbott)

SUSPENSION



Your toughest cases, in both cats and dogs, will respond quickly when treated with SELEEN Suspension.

Nonspecific dermatoses such as moist or dry eczema (including the severe itching type), as well as mange and fungus infections, improve with SELEEN therapy in fewer treatments—even after shampoos, sulfur preparations and other skin medicaments have been tried without success.

Relieves itching—Kills fleas, lice and mites, often in the first treatment. In all cases, SELEEN improves skin texture, eliminates dryness and scales—gives the coat a softer, glossier appearance.

Easy to apply, safe to use—SELEEN lathers fast, rinses easily, requires only 10 to 15 minutes per treatment. There's no offensive odor, no toxic effect, no risk of staining carpets or furniture.

Available to veterinarians only. Order SELEEN direct from Abbott Laboratories, North Chicago, Ill., or from your nearest Abbott branch. You can get SELEEN in 6-fluidounce, pint and gallon bottles.

Abbott

Veterinarian desires position in small animal hospital or mixed practice in Canada. Four years of experience. Married. Will consider partnership, sale, or lease. Address "Box L 10," c/o JOURNAL of the AVMA.

Licensed veterinarian with extensive small animal experience desires position as assistant to practitioner in southern California. Address "Box L 12," c/o JOURNAL of the AVMA.

Position wanted leading to lease, partnership, or sale in mixed or small animal practice. Age 35, licensed in California. Address "Box L 14," c/o JOURNAL of the AVMA.

Veterinarian, small animal and research experience, desires association with progressive small animal hospital. Licensed in California and Nevada; age 28. Address "Box L 17," c/o JOURNAL of the AVMA.

Wanted—Practices

Veterinarian, California license, desires to buy active, small animal practice with large clientele. Substantial cash down payment assured. Address "Box L 11," c/o JOURNAL of the AVMA.

Wish to purchase small animal hospital or location for one in Connecticut or Massachusetts. Substantial sum available. Address "Box L 23," c/o JOURNAL of the AVMA.

Graduate approved school, experienced, desires to lease prosperous mixed practice with intention of future ownership. Prefer Virginia or North Carolina but will consider other. Veteran, married. Address "Box L 13," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale or lease to properly qualified man, 60-kennel brick hospital, separate isolation. A.A.H.A. member located in city of 90,000 at junction of Midwest and Southwest areas near good fishing and hunting. Physical limitations forces disposal in the fairly near future; no blue sky. Qualifications and interest in first letter greatly appreciated. Address "Box L 1," c/o JOURNAL of the AVMA.

Practice for sale in small, attractive Ohio community; 75% large, 25% small animals. Large comfortable home with apartment on second floor. Office conveniently attached with examination room, small reception room, kennel room, and small drug room. Priced at real estate value, \$15,000. Address "Box L 2," c/o JOURNAL of the AVMA.

Small animal hospital for sale; fully equipped, including x-ray. Has 30 cages and 10 outside runs. House is 7-room modern colonial. Practice established 30 years; located within 100 miles of New York City. Large animal work optional. Will require \$15,000 down payment. Address "Box J 1," c/o JOURNAL of the AVMA.

(Continued on p. 48)

**"O thanks, good master,
for the comfort and
relief of
Fleas-Off"**

FLEAS-OFF KILLS AND REPELS FLEAS, TICKS, CHIGGERS, LICE, OTHER INSECTS

Stop the continual aggravation and irritation suffered by your pet. Mist him and his bedding lightly with Fleas-Off—then let him roam and play in freedom from the plague and torture of insects. Fleas-Off also deodorizes your dog's coat—relieves dry skin—keeps him healthy and contented.

**Used in Kennels and
Hospitals Everywhere**

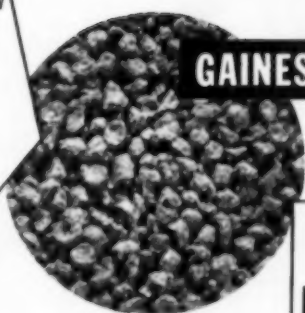


Your Pet Dealer Has Fleas-Off... Hurry!

\$1.25

**the big
difference
here...**

GAINES MEAL



**makes a
big difference
here...**

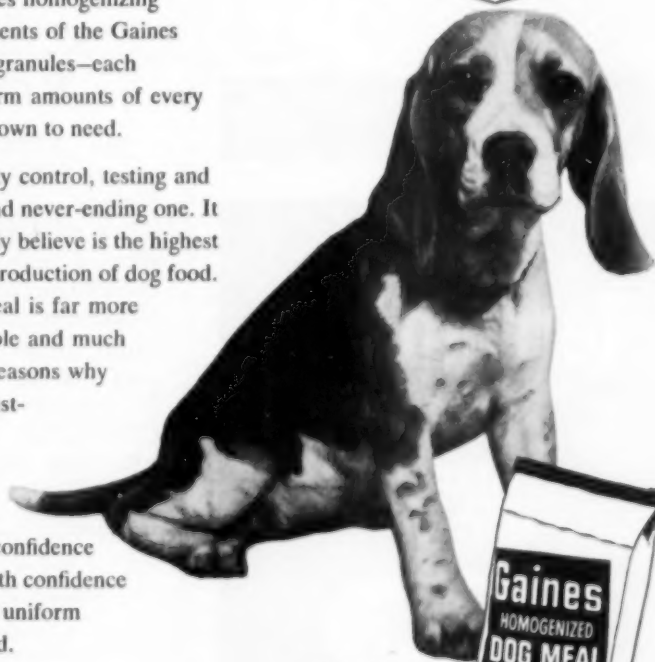
Yes, Gaines makes the difference

because the special Gaines homogenizing process combines ingredients of the Gaines formula into appetizing granules—each granule containing uniform amounts of every food element dogs are known to need.

Gaines program of quality control, testing and research is an exacting and never-ending one. It results in what we honestly believe is the highest standard possible in the production of dog food. Gaines Homogenized Meal is far more assimilable, more palatable and much easier to feed . . . good reasons why Gaines is America's largest-selling dog meal.

Gaines indeed makes the difference . . .

you can use Gaines with confidence
. . . recommend Gaines with confidence
. . . because complete and uniform nourishment is guaranteed.



A Product of General Foods

Gaines **HOMOGENIZED
DOG MEAL**





Provides an accurate pattern against which to cut with knife or razor blade. Fits firmly, cannot move or slip when clamped into position. Made of non-rusting, light, cast aluminum, highly polished. Lasts a lifetime with minimum care. Simplicity of design and construction reduces possibility of breakage or mechanical failure. Forms immediately available to provide distinctive marking of these breeds:

Boxer — postpaid \$15.00
 Boston Terrier — postpaid \$15.00
 Great Dane — Postpaid \$15.00
 Doberman — postpaid \$15.00
 Set of above four — postpaid \$50.00

These patented "championship" forms are patterned after markings of winners of top honors in show competition. Forms for other breeds made on special order. Sold to veterinarians only. Send check or money order.



MacALLAN LABORATORIES

Route No. 2, Box 420

Lansing, Michigan

dispense

Terramycin®

BRAND OF OXYTETRACYCLINE

for
**ADDED
 INCOME**

Pfizer

(CLASSIFIED ADS—continued from p. 46)

Four-room veterinary clinic and garage for sale; x-ray, instruments, drugs, etc.; \$11,000; without adjacent lot, \$8,500. Located on main highway. Address Dr. M. Parker, South 71, Fayetteville, Ark.

Established mixed practice for sale or lease; predominantly dairy. Located in excellent central Oklahoma livestock area. New modern five-room hospital. Excellent opportunity. Address "Box J 23," c/o JOURNAL of the AVMA.

Small animal brick hospital and connecting two-story brick residence for sale in Pennsylvania; 70 ceramic-tile cages, ceramic-tile flooring in kennel and surgery rooms, outdoor runs. Established 30 years. Present gross of \$20,000 could be greatly increased in short time by energetic practitioner. Selling price of \$30,000 is a give-away. Desire to sell by June. Address "Box L 15," c/o JOURNAL of the AVMA.

Extensive mixed practice for sale in Pacific Northwest; beef, dairy practice, 10-20% small animals. Commercial income, \$350. Best reasons for selling. Address "Box L 16," c/o JOURNAL of the AVMA.

(Continued on p. 58)

NOTICE

The AVMA office has received a number of complaints regarding the handling of orders for dog cages placed with the Dee-Chicago Manufacturing Company (Chicago, Ill.).

Subscribers are hereby notified that the JOURNAL discontinued carrying the DEE — CHICAGO advertisements after the August, 1954, issue.

W. L. WILLIAMS

Diseases of the Genital Organs
 of Domestic Animals, 1943,

3rd printing, 1950, \$10.80
 (brief addition by Dr. M. G. Fincher)

Veterinary Obstetrics, 1943,

3rd printing, 1951, \$8.10
 (changes covering advances made in recent years, by Dr. S. J. Roberts)

Published and sold exclusively by

LUELLA WILLIAMS
 109 E. Upland Road
 Ithaca, N. Y.

A Successful New System

for the herd management
of bovine mastitis with

FURACIN[®]

- Proper herd management
- Treatment of mastitis with intramammary Furacin with or without penicillin
- Routine monthly bacteriologic tests of the milk to insure early diagnosis, treatment and cure

Important benefits

1. Remarkably low incidence of chronic mastitis, with practical absence of *S. agalactiae* infections
2. Less udder damage and loss of productive cows
3. Increase in milk production
4. Decrease in milk bacterial counts
5. Less time required of the veterinarian
6. Economical in cost
7. Control completely under professional direction

Furacin for mastitis is available in two dosage forms:

① Furacin-Penicillin Gel Veterinary: Procaine penicillin G and nitrofurazone in oil, a concentrated suspension of microcrystals. It contains 2 per cent Furacin and 13,333 units of procaine penicillin G per cc. in peanut oil with aluminum monostearate. Packaged in a 100 cc. vial for administration by

syringe and in 7.5 cc. single dose, applicator tubes. This Gel is stable for 3 years without refrigeration, until the expiration date on the label.

② Furacin Solution Veterinary: Aqueous 0.2 per cent solution of Furacin in 500 cc. rubber capped bottles. It is permanently stable.

Exclusive distributors to the veterinary profession:

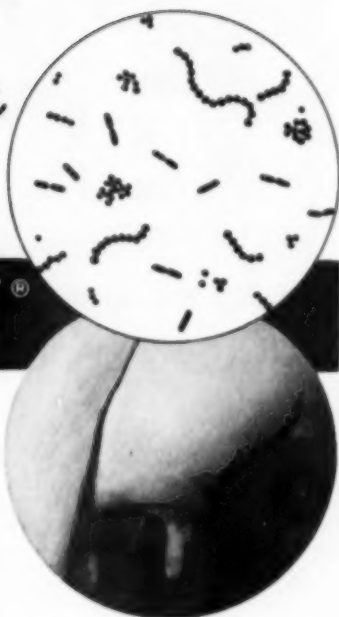
Write for special mastitis booklet.

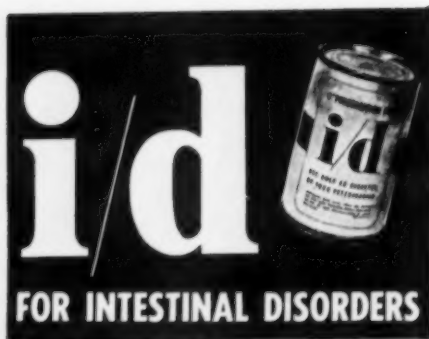
U. S. A.

Winthrop-Stearns, Inc.
NEW YORK 18, N. Y.

CANADA ... **Austin Laboratories, Ltd.**
Guelph

Furacin is the Eaton Laboratories, Inc., brand of nitrofurazone N.N.R.





DIAGNOSIS

Boxer, male, 10 weeks old; thin, rather dehydrated, growth delayed, with bowel movements loose for several days. Presented for worming, ear correction and distemper immunization.

TREATMENT

Weigh the pup, check stool for intestinal parasites and administer temporary distemper protection, but do not worm at present. Delay ear surgery. Administer fluids containing B-complex (subcutaneously), and vitamin A per os. Give frequent feedings of low fat salted broth for the first two days. When bowel frequency has diminished, start the feeding of Prescription Diet, i/d, in properly calculated small amounts 3 or 4 times daily. The total amount of i/d given should provide 25 calories per body pound for a 24 hour period. (i/d = 40 calories per oz.) Gradually increase until the puppy is taking 50 calories per body pound in 24 hours. When the bowel has been formed for 3 to 5 days, add 3 gms. lard for each 97 gms. of i/d. Continue this feeding regime during ear correction surgery and until distemper prophylaxis has been completed. Then, change to Prescription Diet, p/d, at levels prescribed in "Key to Prescription Diets."

RESULTS

Time required depends upon condition of patient.

(Inquiry form for graduate veterinarians only)
HILL PACKING COMPANY, Box 148, Topeka, Kan.
 Send information on therapeutic feeding ☐
 Send information on other Hill products ☐

NAME

ADDRESS

CITY AND STATE

HILL PACKING COMPANY
 P.O. Box 148 Topeka, Kan.

Correspondence

Feb. 8, 1954

Editor:

Your attention is called to an article, "Treatment of Tumors in the Dog" by W. H. Riser (Proc. Book, 1954, p. 279), in which the lack of training of veterinarians in tumor pathology is emphasized. Apparently tumor pathology in general is dismissed as unimportant in our veterinary schools since animal neoplasms are often discarded without examination and diagnosis. One institution apparently considers as a benign tumor any growth which can be removed and as malignant neoplasms those which cannot be removed. Fortunately, this is gradually being rectified but it indicates a need for closer cooperation between the pathology and clinical departments in our veterinary colleges. The pathology of disease is made infinitely more interesting and meaningful to students when it is correlated with the clinical manifestations in the affected animal. Surely the textbook description and microscopic picture of neoplasms should be supplemented with actual gross specimens.

Today, a graduate veterinarian is expected to be a competent surgeon, pathologist, diagnostician, bacteriologist, and even a politician, all in one. His training must, therefore, more adequately prepare him for this professional life. To this end all of our teaching, research, and clinical groups at veterinary schools should constantly work together.

s/James R. Wadsworth
 Department of Animal Pathology,
 University of Vermont, Burlington.

February 9, 1955

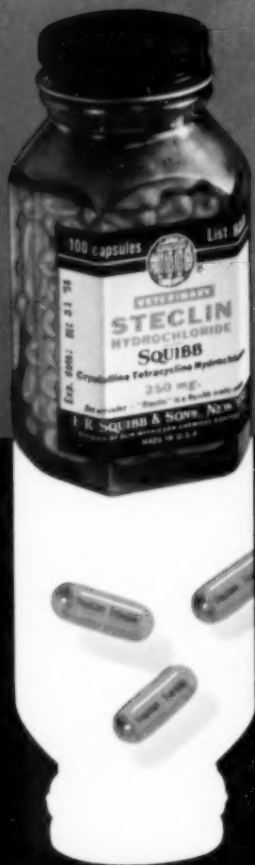
Dear Dr. Aitken:

Time has passed quickly since we met in Chicago and my visit to the U. S. A. is now only a memory but an unforgettable one. Please accept my thanks for the way you and your colleagues at the AVMA office took care of me in Chicago. If this letter could be published in some way in the AVMA JOURNAL, I would be very glad. So many have contributed to make my stay in America the most enjoyable one that it is impossible to reach them all personally. I certainly got to see quite a part of your beautiful country from Boston in the East to San Francisco in the West, from Minneapolis in the North to New Orleans in the South. I attended veterinary meetings, visited veterinary schools and other institutions, and got to know veterinarians all over the country working in different fields of veterinary medicine.

My visit was made possible by the generosity of the Angell Memorial Animal Hospital in Boston and the New England Veterinary Medical Association. Having fully realized that their invitation is a distinction, and feeling at the same time happy

(Continued on p. 54)

Announcing...



STECLIN[®]
Tetracycline Hydrochloride
Veterinary

Steclin[®] is a Squibb trade-mark

ANOTHER
SQUIBB
PRODUCT

SOLD TO VETERINARIANS ONLY

a new word in veterinary practice . . .

S

TECLIN[®]

TETRACYCLINE HYDROCHLORIDE
VETERINARY

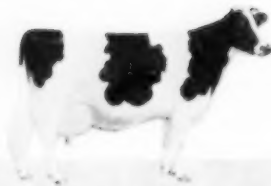
**A NEW SQUIBB ANTIBIOTIC
OF WIDE SPECTRUM
AND LOWER SIDE EFFECTS**

SOLD TO VETERINARIANS ONLY

for treatment of domestic animals

STECLIN...

what it is:



Steclin (Tetracycline Hydrochloride) is a new Squibb antibiotic of wide antimicrobial spectrum, highly effective in the treatment of infections caused by tetracycline-susceptible organisms in domestic animals.

Of particular importance to veterinarians is the unusually low incidence of toxic side effects observed during therapy with Steclin. *Clinical tests with humans have indicated that—with Steclin—undesirable reactions were absent in 93% of the cases treated.**

*Finland, M. et al.: J.A.M.A., 154:561, 1954.



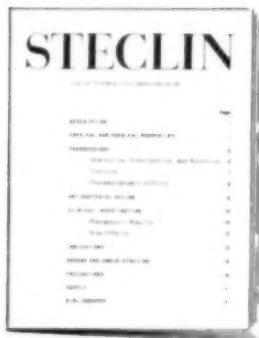
STECLIN... *its action:*

Following oral administration, Steclin is promptly absorbed into the bloodstream, resulting in concentrations highly effective against a wide variety of pathogenic organisms, including gram-positive and gram-negative bacteria, spirochetes, rickettsias, and certain viruses.

The antibiotic is rapidly diffused into various body fluids, including the cerebrospinal, peritoneal and pleural, and it produces high levels in the urine.

STECLIN... *its uses:*

Steclin is indicated in the oral treatment of: Abscesses; bacterial infections associated with canine distemper; bronchitis; calf scours; diphtheria; enteritis; equine influenza; erysipelas; feline enteritis; foot rot; hemorrhagic septicemia; infectious coryza; influenza; lamb dysentery; leptospirosis in dogs; metritis; nephritis; otitis media; parotiditis; peritonitis; pharyngitis; pneumonia; pyelonephritis; septic mastitis; staphylococcal and streptococcal infections in the foal; tonsillitis; ulcerations; upper respiratory complications; urinary tract infections.



AVAILABLE TO VETERINARIANS:
16-page booklet on Steclin, including Physical and Chemical Properties, Pharmacology, Clinical Investigation substantiated by tables and relative statistics, plus other pertinent data.

ADMINISTRATION AND DOSAGE:

Recommended daily dosage, given in divided doses every six hours: *small animals:* 25 to 50 mg. per lb. of body weight; *large animals:* 5 to 10 mg. per lb. of body weight.

Steclin Hydrochloride Veterinary is available in capsules providing 250 mg. crystalline tetracycline hydrochloride.

STECLIN VETERINARY IS SOLD ONLY TO VETERINARIANS.

For further information, write: SQUIBB, Veterinary Department, 745 Fifth Ave., New York 22, N. Y.



SQUIBB
A NAME YOU CAN TRUST

And don't forget...

to check your supply of other valuable animal health products which SQUIBB offers for sale only to veterinarians.



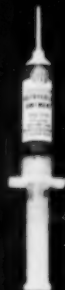
New high potency treatment for ketosis...

PROLACTHYL® HP VETERINARY

Highly purified corticotropin (ACTH) in Prolacthyl HP Veterinary produces greater adrenocortical stimulation unit for unit than older forms of corticotropin—with rapid reversal of ketosis symptoms. Most cases respond to a single dose of 5.0 cc. to 10 cc. (equivalent to 300 U.S.P. units to 600 U.S.P. units).

Blood sugar levels are usually raised to normal limits within 24 hours; increased milk production may generally be expected within 3 days. Supplied in vials of 10 cc.

PROLACTHYL is a Squibb trade-mark



a high effective treatment for mastitis...

DISTRYCILLIN® OINTMENT VETERINARY

Each 5-gram disposable syringe contains 200,000 units of potassium penicillin and 200 mg. of dihydrostreptomycin, formulated in the thorough-penetrating Squibb Base — plasticized hydrocarbon gel.

These two antibiotics have an extremely broad anti-bacterial spectrum, and the Squibb Base assures thorough distribution of the antibiotics through the glandular tissue. Distrycillin in supplied in easy-to-use disposable plastic syringes, and is available in boxes of twelve.

DISTRYCILLIN is a Squibb trade-mark



for topical ophthalmic anesthesia...

OPHTHAINE® VETERINARY SQUIBB

Solution Ophthaine Veterinary instilled into the eye produces local anesthesia in a quick, efficient manner. In addition, it has been shown to be virtually free of undesirable side effects. It is non-irritating to conjunctival membranes.

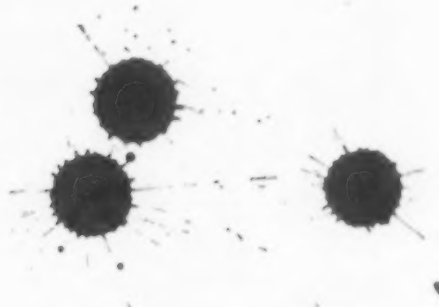
Ophthaine is a sterile aqueous solution containing 0.5 percent of the active ingredient 2-dimethylaminoethyl-3-amino-4-propoxybenzoate hydrochloride. It is supplied in 15 cc. bottles.

OPHTHAINE is a Squibb trade-mark

All these and other Squibb veterinary products are available from your veterinary supply house. For further information, address: SQUIBB, Veterinary Department, 745 Fifth Avenue, New York 22, N. Y.

SQUIBB

A NAME YOU CAN TRUST



stop bleeding . . .

a **drenosem**
SALICYLATE

(brand of carboxochrome salicylate)

systemic hemostat

Adrenosem Salicylate stops capillary bleeding and oozing by direct action on the capillary walls. It is effective by intramuscular and oral administration.

Adrenosem Salicylate can be used pre- and post-operatively in surgery, traumatic injuries, hemorrhage due to infectious disease and internal parasites, or conditions where bleeding from a broad capillary bed is a problem.

Available in Ampuls: 1cc (5 mg.) package of 5

Tablets: 1 mg., S. C. orange, bottles of 50

Tablets: 2.5 mg., S. C. yellow, bottles of 50

Syrup: 5cc contains 2.5 mg. in 4-oz. bottles

For literature write:

S. E. MASSENGILL CO. Veterinary Division **BRISTOL, TENNESSEE**

POLYOTIC*

Lederle Professional Line

- POLYOTIC*** INTRAMUSCULAR:
100 mg.-500 mg.-1.0 Gm.-5.0 Gm.
- POLYOTIC** INTRAVENOUS:
100 mg.-2.5 Gm.
- POLYOTIC OBLETS®**: 4's-6 x 4's
- POLYOTIC CAPSULES**: 50 mg., 25's-100's;
100 mg., 100's; 250 mg., 16's-100's
- POLYOTIC TABLETS**: 50 mg., 25's-100's;
100 mg., 25's-100's; 250 mg., 16's-100's
- POLYOTIC MASTITIS OINTMENT**: ¼ oz.
- POLYOTIC COMPOUND MASTITIS OINTMENT**: ¼ oz.
- POLYOTIC OPHTHALMIC OINTMENT 1%**:
6 x ¼ oz.
- POLYOTIC TOPICAL OINTMENT 3%**: 1 oz.
- POLYOTIC SOLUBLE (Tinted) POWDER**:
¼ lb.-½ lb.-1 lb.-5 lb.
- AVIANIZED® RABIES VACCINE (Canine)**:
1 dose-5 x 1 dose-10 doses
- AVIANIZED RABIES VACCINE (Cattle)**: 10 doses
- AVIANIZED CANINE DISTEMPER VACCINE**:
1 dose-10 x 1 dose
- ANTI-CANINE DISTEMPER SERUM AND ANTI-INFECTIOUS
CANINE HEPATITIS SERUM**: 20 cc. 100 cc.
- INFECTIOUS CANINE HEPATITIS VACCINE**: 2 cc.-10 cc.
- BRUCELLA ABORTUS VACCINE**: 1 dose-5 x 1 dose-
5 doses (25 cc.)
- FELINE DISTEMPER VACCINE**: 1 immunization (2 vials
Vaccine, 2 vials Sterile Diluent, 2 cc.)
- ANTI-FELINE DISTEMPER SERUM**: 50 cc.
- CARICIDE® Diethylcarbamazine TABLETS**:
400 mg., 25's
- DIETHYLSTILBESTROL SOLUTION**: 10 cc.-50 cc.
- LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN
Whole Culture Inactivated Vacuum-Dried.**
- Other products to be added.

*Trade-Mark



LEDERLE LABORATORIES DIVISION

Pearl River

AMERICAN **Chemical COMPANY**

New York

Tetracycline

Here is the newest of the broad-spectrum antibiotics, clinically proved and ready for intravenous, intramuscular, intrasternal, intravaginal, intramammary, conjunctival, aural and topical use.

No other antibiotic is available to the profession only in such a wide variety of dosage forms. No matter what route of administration, there is a POLYOTIC designed for proper professional application and for dispensing. Available to Licensed Veterinarians Only.

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Liquid reconstructive and dietary supplement
for pets

Supplies all necessary vitamins to guard
against deficiency

(See February 1955 Curts "Reminders" for complete formula)



In plastic squeeze bottle with oral applicator
tip for elegance in dispensing.

3 squirts (appx. 1 teaspoonful) is average
daily dose. No messy spoons.

Also available in glass bottles.

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dozen 4 oz glass	4.20
gallon bottle	8.40

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Laboratories

Pharmaceutical Manufacturers to the
Veterinary Profession Since 1918

KANSAS CITY, KANSAS

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Terramycin

BRAND OF OXYTETRACYCLINE

for

CLIENT SATISFACTION



Pfizer

(CORRESPONDENCE—continued from p. 50)

and unworthy of such an honor, I wish here to express my sincere thanks.

Lectureships and honorariums for the presentation of papers on different subjects made the whole trip possible. For this I am much obliged to the following groups, associations, and institutions: the Pennsylvania State Veterinary Medical Association; the School of Veterinary Medicine, University of Pennsylvania; practitioners in Philadelphia; Sharpe and Dohme; Cornell University; practitioners in Chicago; the School of Veterinary Medicine, University of California; the School of Veterinary Medicine, Alabama Polytechnic Institute.

Further, my thoughts and thanks go to all my new and old friends and their families all over the United States, who have received me in their homes with an overwhelming hospitality.

I wish your association a happy and successful year 1955.

Yours sincerely,

s/Sten-Erik Olsson,
Royal Veterinary College,
Stockholm, Sweden.

Actual Hunting Scenes in Gaines' New Gun-Dog Film

"With Dog and Gun" is the title of a new 16-mm. sound and color educational film by the Gaines Dog Research Center, New York. Shown are Pointers, Chesapeake Bay and Labrador Retrievers and pheasant hunting with a German Short-haired Pointer and an English Springer Spaniel. It "covers the country" from quail shooting on a Florida plantation to a quest for sharp-tailed grouse in Saskatchewan and duck-hunting in western Nebraska.

The film runs twenty-seven minutes and is available on free loan to any responsible group which is willing to pay two-way shipping charges from the nearest depository point and which will take good care of the film while in its possession. Requests should be directed to the Gaines Dog Research Center, 250 Park Avenue, New York 17, N. Y.

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Such letters are gratifying, because they indicate how clearly cat owners can see the benefits of good nutrition. And Puss 'n Boots is good nutrition. It is made of whole fish, fresh from the cleansing depths of the sea, processed to retain all of nature's life-giving elements intact. Wholesome, palatable cereals are added for all-round nutrition. Puss 'n Boots therefore assures a cat a balanced supply of needed proteins, vitamins, minerals and other vital nutrients.

You can recommend Puss 'n Boots with confidence

Cats which have been improperly fed on improvised diets usually show remarkable improvement in three weeks or less of regular Puss 'n Boots feeding. You can recommend it to cat-owning clients with the assurance that they will see its benefits for themselves. Puss 'n Boots Cat Food is sold at food stores and pet shops everywhere.



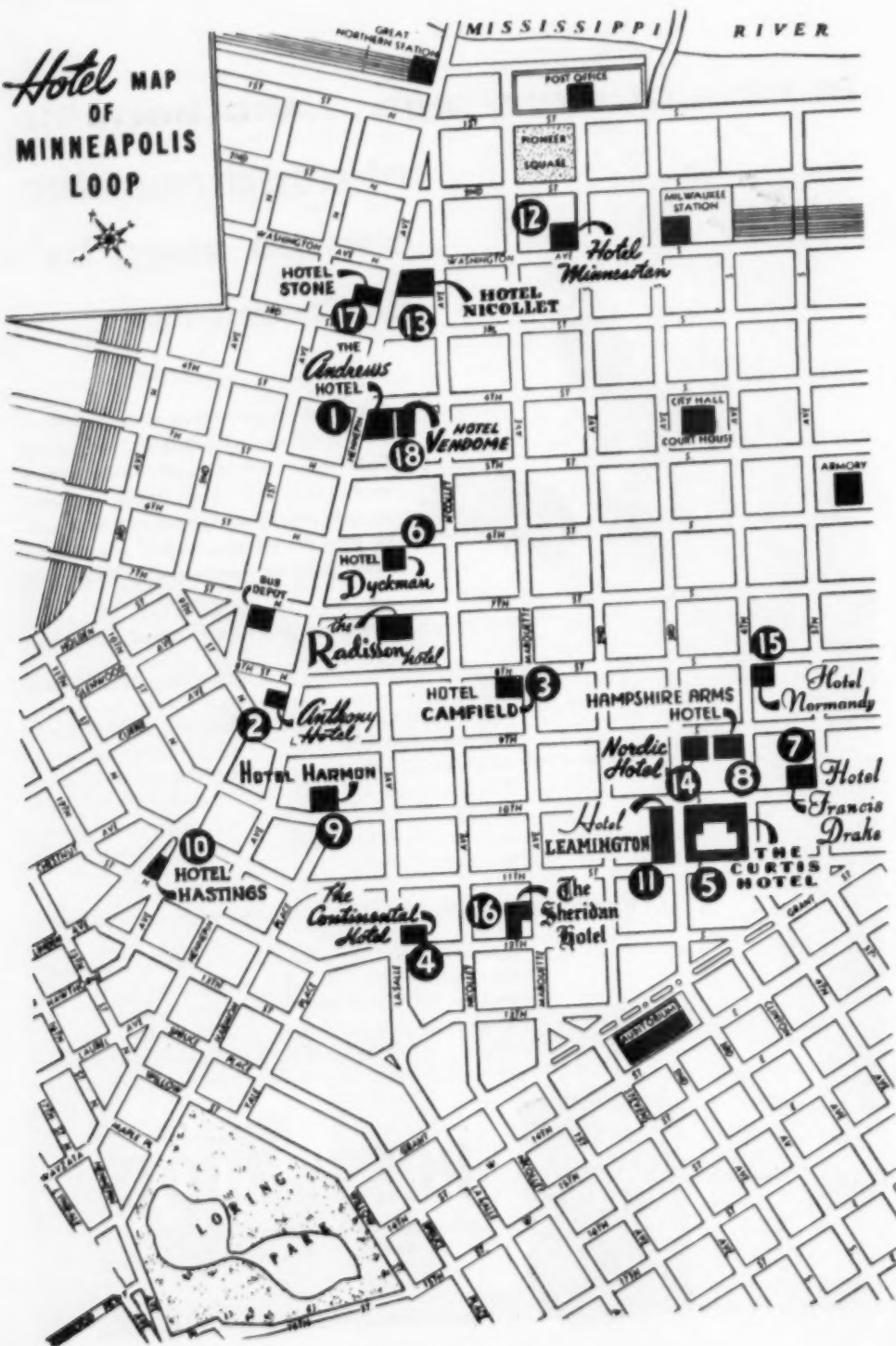
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Hotel MAP OF MINNEAPOLIS LOOP



HOTEL RESERVATIONS — MINNEAPOLIS CONVENTION

Ninety-Second Annual AVMA Meeting, Aug. 15-18, 1955

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

HOTELS AND RATES

HOTEL	SINGLE	DOUBLE	TWIN BEDS
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2. Anthony	\$3.25-4.50	\$4.50-6.50	\$6.00-8.00
3. Camfield	\$3.50-5.00	\$4.50-6.00	\$6.00-8.00
4. Continental	\$4.00	\$5.00	\$6.00
5. Curtis	\$5.00-6.50	\$6.50-8.00	\$8.50-11.00
6. Dyckman	\$4.00-7.50	\$7.00-11.50	\$8.00-12.50
7. Francis Drake	\$5.00-8.00	\$6.50-9.00	\$8.50-10.50
8. Hampshire Arms	\$3.50-4.50	\$5.00-6.00	\$6.00-7.50
9. Harmon	\$3.50	\$4.50	\$6.00
10. Hastings	\$3.50-5.00	\$6.00-7.00	\$8.00
11. Leamington	\$6.00-12.00	\$8.00-14.00	\$9.50-16.00
12. Minnesotan	\$3.50-5.25	\$5.00-7.00	\$7.00-8.00
13. Nicollet	\$5.50-10.50	\$8.50-14.00	\$9.00-14.00
14. Nordic	\$4.00	\$5.00-6.00	\$7.00
15. Normandy	\$5.00-7.00	\$7.50-8.00	\$9.00-10.00
16. Sheridan	\$4.50-5.50	\$6.00-7.00	\$8.00
17. Stone	\$3.25	\$5.00	\$6.00
18. Vendome	\$3.00-4.00	\$4.50-5.50	\$5.50-6.00

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To: HOUSING BUREAU

Minneapolis Convention and Visitors Bureau
1750 Hennepin Avenue
Minneapolis, Minn.

Please make reservations indicated below:

_____ Single room(s) at \$ _____
 _____ Double bed rooms at \$ _____
 _____ Twin-bed rooms at \$ _____
 _____ Suite (specify type of accommodations wanted)

(Three choices MUST Be Shown)

First choice hotel _____

Second choice hotel _____

Third choice hotel _____

Arriving on (date) _____ at _____ a.m. _____ p.m.

Leaving on (date) _____ at _____ a.m. _____ p.m.

Room will be occupied by (attach list of additional names if necessary).

Your Name (Print or Type) _____

Street Address _____ City and State or Province _____

Small animal hospital for sale in Hollywood, Calif.; established 20 years, no real estate involved. Will finance responsible party. Address "Box L 5," c/o JOURNAL of the AVMA.

Outstanding, well-established, small animal hospital for sale in wealthy southern California area; well located, modern, fully equipped. Opportunity for one or two men with \$15,000 or more as down payment. Address "Box J 13," c/o JOURNAL of the AVMA.

Well-equipped animal hospital for sale in Arkansas City of 18,000; 60% large animal, 40% small animal. Real estate and equipment, \$23,000. Veterinarian leaving to devote full time to farms but will remain to acquaint purchaser with practice. Address Dr. J. A. Pulliam, Jonesboro, Ark.

Central Pennsylvania mixed practice for sale. Brick house, two-car garage, office basement rear; \$19,500, will finance. Address "Box J 2," c/o JOURNAL of the AVMA.

Busy dog and cat hospital for sale; long-established, lucrative practice on main thoroughfare in built up area Long Island, N.Y. Modern brick hospital, capacity 75. Ill health compels me to retire. Exceptional opportunity, 1 or 2 veterinarians. Address "Box D 5," c/o JOURNAL of the AVMA.

Mixed practice for sale in Midwest city of over 10,000 population; includes modern office, complete drug and equipment supply, x-ray, steel kennels, operating table, et cetera. Grossing over \$20,000; 90% large animal. Testing available. Address "Box K 1," c/o JOURNAL of the AVMA.

Established fully equipped modern animal hospital for lease; located in fastest growing area in Maryland. Practice draws from community of over 100,000. Reasonable lease terms. A comfortable home adjoins the hospital. Address "Box L 19," c/o JOURNAL of the AVMA.

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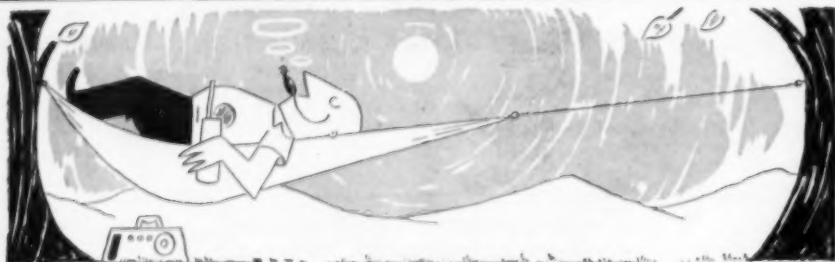


Details the advantages of carrot oil vitamins when used in feeds to improve breeding results; to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today
NUTRITIONAL RESEARCH ASSOCIATES
Dept. 251-M. South Whitley, Indiana

Lost

Male Irish Setter strayed or stolen from home, January 12. Name Shaun, 11 months old; may be offered for sale. Pink pad on right hind foot. Reward. Phone or write Mimi Bennett, 4038 Fairway Drive, Wilmette, Ill. Telephone Wilmette 6690.

(Continued on p. 62)



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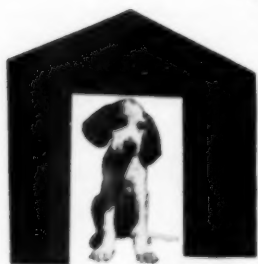
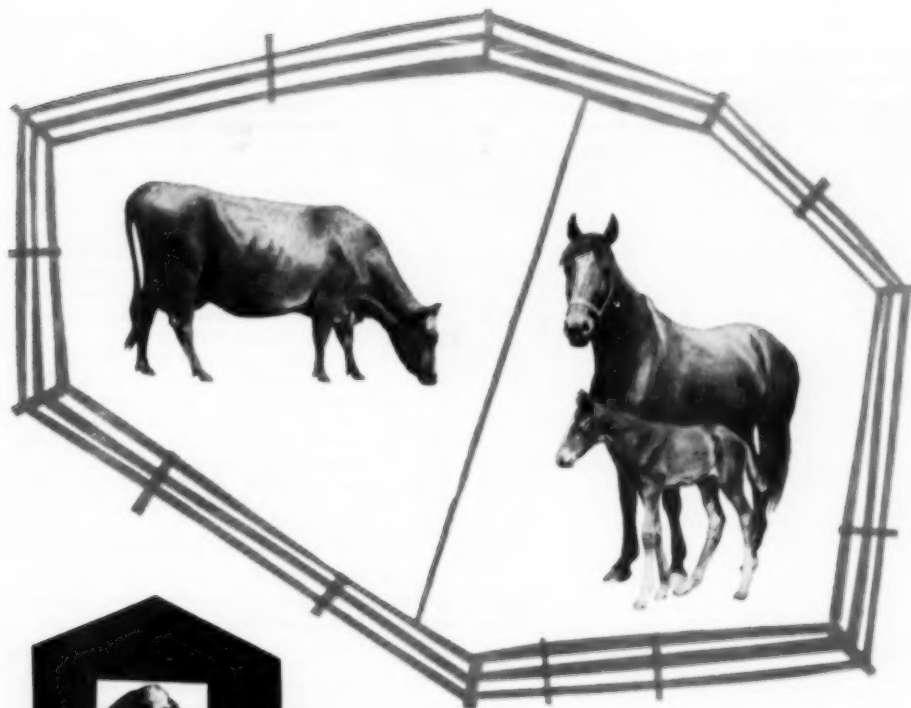
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again confirmed clinically in 1,322
large and small animals

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parenteral hemostat

note the conclusions of this 1954 report^{*} on 10 years of use—

"proved exceptionally effective"

"provided a markedly clearer operative field"

"no incompatibilities, or untoward side effects"

KOAGAMIN, an aqueous solution of oxalic and malonic acids for parenteral use, is supplied in 20-cc. diaphragm-stoppered vials.

^{*}Rachman, M., and Frucht, T. R.: Vet. Med. 49:341, 1954.



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Dr. Robinson Joins Staff of Pitman-Moore Company

Pitman-Moore Company, Indianapolis, a division of Allied Laboratories, Inc., has named Virgil B. Robinson, D.V.M., Ph.D., as chief pathologist. H. O. Ball, executive vice-president has announced. Dr. Robinson will be in charge of the company's veterinary diagnostic laboratories in Zionsville, Ind.

A native of Alabama, Dr. Robinson received his D.V.M. degree from Alabama Polytechnic Institute in Auburn. He was awarded his masters degree by Ohio State University in 1939, where he majored in veterinary pathology.

During World War II, Dr. Robinson served as an officer in the Veterinary Corps, U. S. Army. Following the war, he returned to the Texas A. and M. College as a professor of veterinary pathology and bacteriology.

In 1949, he was given a leave of absence for graduate study as research fellow at the School of Medicine, Vanderbilt University, where he received his Ph.D. degree in 1951. He then returned to Texas A. and M. College as professor and head of the Department of Veterinary Pathology and Parasitology. He is a member of the American College of Veterinary Pathologists, American Veterinary Medical Association, United States Livestock Sanitary Association, Animal Disease Research Workers in Southern States, Conference of Research Workers of Animal Diseases in North America, Society of Sigma Xi, Phi Zeta (National Honorary Veterinary Society) and Phi Sigma.

Quaker Oats Company Produces "Member of the Family"

A movie, "Member of the Family" has been produced in Hollywood by Warner Productions for the Quaker Oats Co. (Ken-L-Products Division) and will be made available nationally.

Buttons, of dubious parentage, is adopted reluctantly by the Carter family but careful and patient training, a well-balanced diet, regular feeding, and love of the family soon develop him into a solid citizen for whom no apologies are necessary. He eagerly demonstrates how he learned to come when called, to retrieve, to "heel," to "sit," to "stay," and do several tricks to boot.

The Carter family grows to love Buttons and no family plans are made without considering him. He returns their love with loyalty and affection, confident that he has earned his position as a "Member of the Family." The film is available without charge through Association Films, located in the following cities: 347 Madison Ave., New York City 17; 79 E. Adams St., Chicago; and 351 Turk St., San Francisco.

Puss'n Boots on Radio.—A radio program, written and produced for Puss'n Boots and presented over the NBC network, is entitled "Mr. Jolly's Hotel for Pets."

The largest of the bats, the flying fox, has a wingspread of 5 feet.—*Sci. News Letter*, Jan. 22, 1955.

SELF FILLING SYRINGE

The multi-injector's third hand



Another accurate smooth working ground glass barrel — leak proof metal plunger instrument with many possibilities. Adjustable for any capacity. By attaching one end of a rubber tube to the self-filling syringe and the other to a bottle of serum or vaccine any number of quick 1/4cc to 5cc accurate dose injections can be made. The instrument is operated with one hand. Anyone who injects a large number of animals will find the Self-Filling Syringe will pay for itself both in labor and serum saved after the first day's use.

Sizes 2cc and 5cc

Literature upon request

Inquire at your nearest veterinary dealer or wholesaler about this new improved outstanding product.

Boston Instrument Mfg. Co. Inc., 50 Thayer Street, Boston 18, Mass.



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*the milk fever
treatment that contains
calcium d-saccharate*

CAL- DEXTRO.

**for greater safety,
more prolonged blood levels**

In clinical hypocalcemic conditions, Cal-Dextro supplies optimum amounts of quickly-assimilable calcium salts, including *d-saccharate*, which (1) reduces the toxicity of the calcium solution and (2) produces more persistent blood levels. In addition, the formula supplies dextrose, beneficial in hypoglycemic complications. Cal-Dextro No. 2 also contains phosphorus and magnesium, which serve as synergists. Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

Miscellaneous

Sales agents or salesmen wanted to call on veterinarians with a line of large animal pharmaceuticals, et cetera; excellent commission. Address "Box L 8," c/o JOURNAL of the AVMA.

Breeders' Sleeve—the disposable obstetrical sleeve. Package of 20 with detachable chest band, \$5.00; lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

Clipper Blade Sharpening—guaranteed to please you; factory trained. Our customers recommend us; 1,000 satisfied veterinarians. Avoid C.O.D.; send money with blades; 24-hour service. Service Grinding Co., 903 Chicago Street, Racine, Wis.

Bovine Prolapse Preventer—Payton Utero-Vaginal Prolapse Preventer quickly easily applied to any size cow. Aluminum, re-usable, nonirritating, sanitary; noninterference with placenta release. Excellent for vaginal protrusion; dispensing. See article, JOURNAL of the AVMA, Dec., 1951. Only \$3.00; two for \$5.00; six for \$12; prepaid. Dr. Jerome Payton, Morris, N.Y.

Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: \$7.00; 2 or more tests, \$6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

Remittance must accompany advertisement

Officers of the Hill Packing Company



Charles Widsteen (left), assistant manager; Burton Hill, president and manager; A. E. Fork, advertising manager; and J. F. Pleskach, advertising agent.

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—repaired in bottom clipper blades.
Top and bottom blades sharpened to match. Save money—Guaranteed.
Prices on Request
HIGHLY SPECIALIZED SHARPENING
Sales—Repairing on Oster
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Terramycin

BRAND OF OXYTETRACYCLINE

for

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THERAPY**

Pfizer

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Official organ of American Society
of Parasitologists

A medium for the publication of papers on Animal Parasites (Protozoa, Helminthes, Arthropoda).

It also publishes the program and abstracts for the annual meeting of the American Society of Parasitologists in a Supplement.

Regular numbers appear in February, April, June, August, October and December.

Subscription price, \$7.50 the year (Foreign, \$7.90).

GEORGE R. LA RUE

CHAIRMAN, EDITORIAL COMMITTEE

JOURNAL OF PARASITOLOGY

U.S. Bureau of Animal Industry,

Zoological Division

Beltsville, Maryland

REFUAH VETERINARIATH*Published quarterly by**Israel Veterinary Medical Association**Articles and discussions, in Hebrew and in English, pertain to Israel in particular and the Middle East in general. \$3.00 per year**Dr. H. C. Newman**P.O.B. 145**Merrifield, Va.***Symposium Sponsored by Squibb**

A symposium on recent advances in the use of ACTH, cortisone, and hydrocortisone in veterinary medicine, sponsored by E. R. Squibb and Sons, will be held at the Sheraton-Plaza Hotel in Boston Wednesday, April 13, 1955. Beginning at 9:00 a.m., the program will include six sections: (1) physiology of the pituitary-adrenal system; (2) veterinary applications of the hormones; (3) uses of the hormones in small animals; (4) research panel on ketosis; (5) practitioner's panel on ketosis; (6) question and answer period. The symposium is open to veterinarians and scientists — no registration fee.—Robert R. Marshak, D.V.M., Chairman.

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strikes**

1

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of your friends

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PRICE
Compare
RESULTS
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Prescribe
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THE ORIGINAL
UDDER BOUGIE

MASTICS P&S

100,000 units penicillin
50,000 mcg. dihydrostreptomycin

MASTICS act fast because medication in high concentration is quickly dispersed throughout the quarter. Improvement often noted in 12 hours.

MASTICS contain no grease, no wax, no insoluble materials to remain in the udder retarding antibiotic action. MASTICS milk out completely—produce no residue on the strainer.

MASTICS are so effective, cows are returned to the herd more promptly with less loss of production.

**LOW IN COST...HIGH IN POTENCY
MASTICS SAVE TIME, MONEY, MILK**



WRITE FOR SAMPLES AND PRICES

The M Martin Laboratories
West Chester, Penna.



electric firing iron in case

firing thoroughbred

New NICHOLSON hi-current firing iron gives even heat on half the current

Our new 1955 hi-current firing iron is now ready for shipment. With a new, greatly improved transformer, this unit uses half the power formerly needed. Only 600 watts! This means you get constant, even heat in barns with old wiring.

You can use the new NICHOLSON electric firing iron and cautery in many simple surgical operations such as removal of warty growths, ear polypi, certain tumors, and in castration or spaying. And, of course, for firing, it is unexcelled. Heat is instant—and constant at any one of the three "heats" you select, 110 v AC. Comes in steel covered case with washable black lining. Supplied complete with 11 tips and points.

Write for leaflet about this superb instrument, or ask your veterinary supplier. Nicholson Manufacturing, Inc., Box 7115, Denver 6, Colorado, precision veterinary equipment

NICHOLSON



NEW electric dairy cow branding iron available with B, T or V

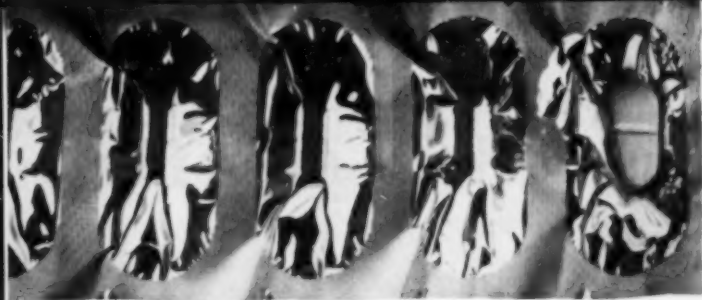
Here's the neatest, slickest thing in branding irons yet. This new NICHOLSON electric branding iron heats in only 90 seconds on regular 110 volt AC-DC current! Just plug it into house or barn wiring. Won't smoke or corrode. Uses the same fast-heating elements they use on the newest electric ranges. Element is formed into 3½" letter B, T, or V. Supplied complete with 6 foot cord for \$21.50. Special 25 foot extension cord, \$6.00. Prices FOB Denver. All NICHOLSON precision veterinary equipment is guaranteed—money back if you aren't satisfied. We ship mail orders the same day they're received if at all possible. Order your new electric branding iron today. NICHOLSON Manufacturing, Inc., Box 7115, Denver 6, Colorado, precision veterinary equipment

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precision veterinary equipment

Index to Advertisers in This Issue

Abbott Laboratories	17, 45
Affiliated Laboratories	9, 26
American Optical Co.	31
Armour Veterinary Laboratories	24, 41
Arnold Laboratories	12
Ashe Lockhart, Inc.	3rd cover
Associated Veterinary Laboratories, Inc.	6, 7
AVMA Report	8
Boston Instrument Mfg. Co., Inc.	60
Burdizzo	54
Campbell X-Ray Corp.	40
Carter Luff Chemical Co.	44
Chatham Pharmaceuticals, Inc.	59
Classified Advertisements	42
Clipper Service	62
Coming Meetings	30
Corn States Laboratories, Inc.	2nd cover
Correspondence	50
Curtis Laboratories	54
Diamond Laboratories	21
Saton Laboratories	25
Fort Dodge Laboratories, Inc.	28, 61
Friskies Dog Foods	22
Fronm Laboratories, Inc.	15
Gaines Dog Food	47
Grain Belt Supply Company	36
Hamilton Pharmacal, Inc.	19
Haver Glover Laboratories	66
Hill Packing Company	50
Hotel Reservations	56, 57
Jackson, Dr. Stephen	20
Jensen-Salsbery Laboratories, Inc.	4th cover
Journal of Parasitology	62
Ken-L Products	13
King Research, Inc.	43
Kirschner Manufacturing Company	38
Lederle Laboratories	52, 53
MacAllan Laboratories	48
Martin Laboratories	63
S. E. Massengill	51
Miles Laboratories, Inc.	10
National Laboratories Corporation	5
H. W. Naylor Co.	32
Nicholson Manufacturing, Inc.	64
Norden Laboratories Corporation	1
Nutritional Research Associates	58
Osco Chemical Company, Inc.	44
Parke, Davis & Company	29
Pfizer Laboratories	14, 27, 42, 48, 54, 62, 65
Pitman-Moore Company	3
Popper & Sons, Inc.	34
Professional Printing Company, Inc.	58
Puss 'n Boots Cat Food	55
Ralston Purina Company	23
Refuah Veterinarian	63
Research Laboratories, Inc.	39
Riverside Iron Works	44
Sharp & Dahme, Inc.	11
Squibb	Insert between pages 50-51
Swift and Company	18
Upjohn Company	35
U. S. Bonds	37
Veterinary Diagnostic Laboratories	42
Vitamin Products Company	16
White, Dr. George Ransom	40
Whitmore Research Laboratories, Inc.	46
Williams, Luella	48
Wilson & Co., Inc.	33
Winthrop Stearns, Inc.	49



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Tetracycline-Vet Bolus

extending basic broad-spectrum
tetracycline therapy to oral
and intrauterine administration
in large animals . . .

Each Tetracycline-Vet Bolus

contains 500 mg. of tetracycline, and is available
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Recommended dosage:

ORAL—large animals: 5 to 10 mg. per lb. per day
small animals: 25 to 50 mg. per lb. per day

INTRAUTERINE—1 to 2 tablets in each horn in
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The Growing Tetracycline-Vet Line

Bolus: 500 mg., in cartons of 5

Intravenous: 250 mg., 500 mg., 1 Gm., and
2.5 Gm. with Water for Injection, U. S. P.

Capsules: 100 mg., in bottles of 100;
250 mg., in bottles of 16 and 100

Intramuscular: 100 mg., 2.5 Gm., and 5.0 Gm.

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Valuable

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES, Brooklyn 6, N. Y.
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therapeutic blood levels adequately sustained

Maintenance doses of Sulfa-4 will sustain therapeutic blood levels.

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dependable therapeutic results

Sulfonamides are highly effective in most acute bacterial infections. They are often superior to antibiotics in common urinary tract and other infections.



HAVER-GLOVER LABORATORIES, Kansas City, Mo.

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(Lockhart)

PHENOLIZED RABIES VACCINE CONTROLS OUTBREAK

According to Frederickson *et al.*,¹ the 1950 to 1951 rabies epizootic in St. Louis was controlled quickly, by mass vaccination of the dog population, after quarantine measures alone had failed. Neighboring communities continued to have a high incidence of rabies. Although only about 0.5 percent of the 38,006 dogs vaccinated in the clinics received modified live virus vaccine, and the overwhelming majority received the usual 20 percent phenolized vaccine of caprine and ovine origin, not a single case of postvaccinal paralysis was reported to the Health Division. These figures would indicate that the danger of postvaccinal paralysis in dogs, following administration of phenolized rabies vaccine, may have been greatly exaggerated recently.

1. Frederickson, L. E.; Willett, J. C.; Smith, J. E., and Price, E. R.: Metropolitan rabies epizootic controlled by vaccination. *Vet. Med.* 48 (1953) 276-279, 280.
(from *The North American Veterinarian*, Nov. 1953)

Experience —

The article at left as news is not new. It is timely only because it is human nature to seek the sensational, and overlook tried and time-proven methods. Phenolized rabies vaccine has been used as an efficient control measure for many years.

Efficiency —

Immunity developed by phenolized rabies vaccine (for a practical period of time) is as good as that from any other rabies vaccine, as reported by the Public Health Service.

Effort —

Throughout the years Lockhart has tried to have adequate supplies of Rabies Vaccine available for immediate shipment at all times. Even during the stress of the unprecedented demand upon the industry during the 1954 vaccination season, no one was without vaccine of Lockhart manufacture.

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Lockhart Rabies Vaccine

is produced by veterinarians — sold only to veterinarians —
and never sold at a discount to any agency. It is TRULY

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back your professional judgement with

Jen-Sal

quality products
for the veterinarian
exclusively

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SV-2

modified
live virus
(porcine origin)



*

Simultaneous

Virus

number 2

available in

2 dose

5 dose

10 dose

25 dose

50 dose

packages

A clinically proven advancement in hog cholera immunology, Jen-Sal SV-2 given with a minimal dose of serum provides immediate protection and durable immunity without post-vaccination virus flare-ups or live virus premise contamination.

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